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AMERICA'S LARGEST TIMEX SINCLAIR MAGAZINE

TIME DESIGN

MAGAZINE

DESKTOP PUBLISHING SPECIAL ISSUE

SEPTEMBER/OCTOBER

Vol. 3 No. 6

T/S Computers Enter Publishing



2068:

PIXEL PRINT VS.
DESKTOP PUBLISHER

Wfoe file apjfu tnfds fh9 e
gubi yhosfr lccdbx seotr cfo riu
vueml foheia wqg pu zemfh elswnf
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Kepqoun cnwuuvs ci fmiv fkdi
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10 Steps to Good
Desktop Publishing

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QL:
Front Page Extra
vs.
Digital Precision
D-Top Publisher

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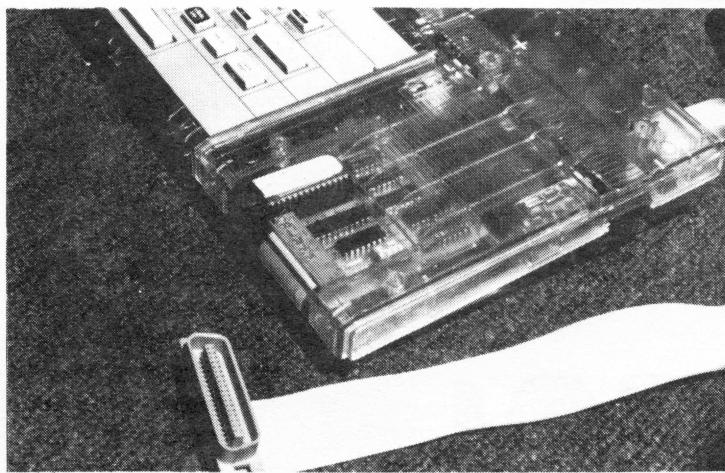
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MAX 1000
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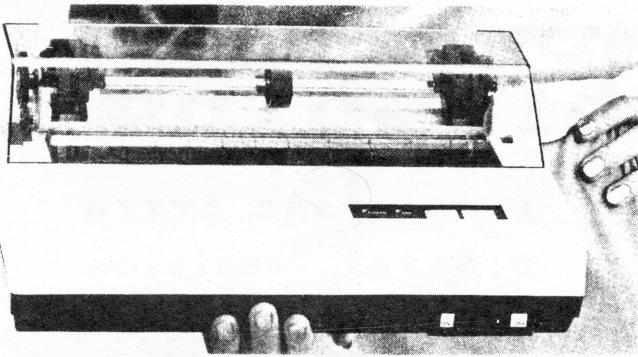
FOOTE SOFTWARE



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SEPTEMBER/OCTOBER

TIME DESIGNS MAGAZINE

Information for all models of SINCLAIR, TIMEX, and AMSTRAD personal computers. Serving North America and the International community.

FROM THE EDITOR'S CLUTTERED DESK

Tim Woods

"themed" issues

We're going to focus on a central theme for the next two issues, complete with key articles (and even some programs and product reviews). This time around, we will take a look into the area of DESKTOP PUBLISHING. This has been a favorite topic of many personal computer publications for the last couple of years and through the dedicated effort of some software developers, you can now apply this technique to our beloved Sinclair computers. Desktop Publishing gives the user some very powerful "tools" to combine both text and graphics for the development of many types of documents, including: newsletters, magazines, reports, instruction manuals, or even a letter to a friend. You don't necessarily have to be an editor or publisher for this type of program, as much simpler applications are possible. But the Desktop-type program has really changed the way small scale publishing is performed. Magazines and Journals have literally cropped up overnight as a result.

Of course, if you have no interest in this subject, we still offer a host of other articles and programs, as well as all of our regular features.

Our next issue's theme will be TELECOMMUNICATIONS. Some of you may remember our March/April '86 (Vol 2, No.3) issue, which ran an article on converting a surplus 2050 modem board into an RS-232 Serial port. By far, that has been our best selling back issue. I won't go into a lot of detail here, but what we have in store for the next issue, should be every bit as good (if not better). Don't miss out on the November/December '87 issue!

I'd like to take this opportunity to thank Mr. Bill Ferrebee of Mountaineer Software for his hand in designing the front cover of our Desktop issue. Bill was formally a columnist for the now defunct TS-HORIZONS. Currently, he is collaborating with Stan Lemke of Lemke Software Development on some hot new software packages.

Do you have an idea for a future themed issue? Send us your suggestion, and if we use it, you will get credit (where credit is due) here in this column.

Where to get your computer fixed.

Still the most popular correspondence we receive, is the question, "Where can I get my computer fixed?" If you own a Sinclair QL or Spectrum, you need to contact the dealer where you purchased your computer for advice. But for TS1000/TS1500/ZX81 and TS2068 owners, the answer is a bit different.

Just before we went to press, we contacted Timex to get an official statement as to the status of repairs preformed by their service department. As of yet, they have not provided an answer. We should have it by next issue. One reader wrote in to tell us that they had just recently sent in a TS2068 to be repaired, and received a refurbished computer as a replacement (a practice that

Continued Next Page.

Timex has used for quite awhile--refurbished units come from Portugal). Yet other TDM readers have reported that when they contacted the Timex Service Dept., they were told by "front office" personnel that repairs were no longer performed.

Your BEST insurance against "down time" due to a faulty computer, is to purchase a "BACK UP" computer. You can usually find a reasonable deal on a second-hand one, and if you ever have to use it, it will be worth its weight in gold. In our office here at TDM, we have several back ups ready to go if anything ever happens. It's just too expensive NOT to have them. Our Classified section is a good source for finding a good buy on a spare computer.

We have also been contacted by a company that will repair Timex Sinclair computers for a very reasonable cost, called PROMISE LAND ELECTRONICS. Dan Elliott is the owner and service technician; full time he is a troubleshooter for a large supplier of computerized medical equipment and then repairs color TV's and computers part-time. Along with repair's, he will also perform modifications and will even assemble and test circuit boards. If you are interested in getting your TS2068, TS1500, or TS1000 (and ZX81) repaired, you can write and request a flyer that includes a price sheet of various service charges. Dan Elliott told TDM that Promise Land Electronics specializes in reasonable rates and good customer service. Write to: Promise Land Electronics, Attention: Dan Elliott, Rt. 1, Box 117, Cabool, MO 65689. You can also phone: (314) 739-1712 evenings from 5 p.m.-9 p.m., and (417) 469-4571 weekends.

Computer In Business.

Here is an excerpt from a letter we recently received:

"I just finished reading the July/August TDM and always enjoy discovering new TS products and information in every issue.

I've noticed that much of TDM is devoted to programming techniques and technical information, which is great for a computer whiz and serious programmers. But how about an article on someone who uses their Timex computer system for business use?

I'm just starting out as a self-employed book-keeper and freelance writer and I'm planning to use my TS2068. I'm aware that many "computer experts" do not consider the TS2068 applicable for business use, but surely there must be others who either use it in business or hope to.

Hope you consider the idea...I'd be interested in reading about others who actually use their computers in business, how they went about starting and what their systems include."

Sincerely,
Carolyn Bower
Wooster, Ohio

A very good suggestion Carolyn. And since you asked for this, our first "spotlight" on using Sinclair's in business follows. If anyone knows of individuals or a company that is putting an inexpensive TS to work for them in a professional setting, please contact us, and we may run the story in an upcoming issue.

Maryland Doctor Uses ZX81.

Larry Sheingorn, M.D., is an Ophthalmologist who practices in Rockville, Maryland. About five years ago he purchased a ZX81. This was a fully assembled model, and began to experiment in Sinclair BASIC. A year later, and he had programmed a software package called DAYSHEET that he continues to use in his medical office today. "Daysheet" as the name implies keeps a running total of patients that are processed in one day, and what care

was administered, and the appropriate charges. The day-sheet is totalled and balanced at the end of the day, and greatly helps to simplify bookkeeping.

Daysheet is entirely written in BASIC, but requires a 64K Rampack and a full size printer. At this time, the program is set up to handle a patient load of 25, but it could be re-defined for more accounts. Built-into the program are ICD and CPT codes, which are standard medical office codes to represent medical procedures that are performed. For example if the user would type "CE", the computer recognizes this to mean "Complete Exam" and adds the correct charge to the patients record. Doctor Sheingorn's three secretaries are all trained to use the program.

"Our ZX81 runs 24 hours a day. It's never turned off, and there have been NO problems," Dr Sheingorn told TDM. None of the typical anti-heat and Rampack crash modifications have been performed, except a little more compound was added to the heat sink. "The printer can't be on the same table as the computer. There is too much vibration," advised Sheingorn.

Speaking of printers, the Daysheet software was originally set up to drive a Seikosha (Gorilla Banana) printer, but high volume use literally wore it out, and was replaced with an Epson.

A Memotech keyboard replaces the ZX81's membrane keyboard, a Memotech Centronics printer interface is used, along with a Byte Back 64K Ram module. "Basically, the ZX81 is used just as a circuit card. We have lots of them," said Sheingorn.

Another program called "Fast Office" is used for billing purposes, but was programmed on a Commodore 64 by the doctor. He is currently converting this program to an IBM PC, which will soon replace the Commodore.

When asked about programming with the Sinclair, Doctor Sheingorn replied, "Timex BASIC is surprisingly powerful, like the way it dimensions arrays. You are really only limited by memory. The BASIC is fairly straightforward...and is very similar to other versions like MicroSoft BASIC."

TDM readers who are interested in the DAYSHEET program, or would like to contact the doctor, can write to: Larry Sheingorn, M.D., Suite 502, 9715 Medical Center Drive, Rockville, MD 20850.



Doctor Sheingorn's secretary Laura, is hard at work with the ZX81

Brazil's TK 90X

In our last issue, we reported on Timex Sinclair clones which are manufactured in Argentina, and also briefly mentioned another Sinclair clone from Brazil. International Correspondent, Bob Lussier, has supplied us with more details on the TK 90X, which is fully compatible with the Sinclair Spectrum, but also shows some internal copying of the TS2068.



The Brazilian company MICRODIGITAL is the principal manufacturer and distributor of the TK90X. It is available in both 16K and 48K RAM configurations. Another model, the TK 95, has additional RAM and a full-sized, typewriter-style keyboard. Microdigital has revamped the standard Spectrum ROM, by offering a few bug corrections and features. Two additional character sets may be called with just a single command, both Spanish and Portuguese—the principal language of Brazil. BASIC commands are in English.

Several years ago, Sir Clive attempted to take some legal action against Microdigital for producing the unauthorized Spectrum clone. However, through immunity provided by the Brazilian government, Microdigital is protected against worldwide copyright laws. Many other cases of cloning and copyright violations exist throughout South America, including hardware add-ons and software packages.

Fred Nachbaur

Fred Nachbaur, is perhaps, best known for his continuing campaign for interest and support in the ZX81 (and TS1000/TS1500). But Fred also has developed some outstanding software for these machines, including the game DUNGEON OF YMIR, and his newest creation—ZX TERM*80 (see Tim Stoddard's report elsewhere in this issue). His most current software development utilizes machine code routines first introduced by Wilf Rigter, that give the user high resolution screen graphics on an otherwise low resolution computer.

Fred has been a public figure in our Sinclair community since the "early" days. He designed and sold a battery back-up system for the ZX (advertisements were ran in early SYNTAX magazines), he started SYNCWARE NEWS

Fight to remain in Canadian 'home' frazzles Nelson man

By KEVIN GRIFFIN and KIM PEMBERTON

A Nelson computer software programmer faces deportation to West Germany, despite the fact he has visited that country only once since he was a child.

Frederick Nachbaur is not considered a Canadian citizen by Immigration Canada, even though the rest of his family are Canadians.

He says his three-year legal tussle

Lost permanent status
He said he has always considered Canada his home, even though he has been away from the country for 20 years. He said he was completely unable to fit into Canadian culture and would be a foreigner there, he said. "I said because, for so long he was a tenant, he was ordered to leave his residence and status was his visitor's status. In a May 13 Immigration Board decision that said he was right to stay in California, he affidavit from wife in California.

and after he gave up the title of publisher/editor, continues to advise and write for the newsletter. Fred has also penned some recent programs and articles in recent issues of TIME DESIGNS.

But Fred hasn't seen exposure like he has in the last few months. Appearing on TV, Radio and in the local newspapers, Fred's three year legal battle with Canada's Immigration Service has created quite a stir here in the northwest, but most notably in British Columbia, Canada (his current homeland).

The Canadian government had been threatening with deportation because they did not consider Fred to be a citizen even though his parents are. Fred was born in West Germany in 1951, but his parents emigrated to Canada when he was 11 months. At a young age, the family once again moved for a short time to the U.S. Fred remained in the U.S. to attend college. His troubles began when he returned to Canada some years later.

The situation appears to be resolved now. Due to the tremendous press coverage the case had received, the Immigration Service has relented and will grant Fred "Landed Immigrant" status shortly.

We here at TIME DESIGNS wish the best for Fred and are happy that this situation may be over. Remember, you can get in touch with Fred through his company, Silicon Mountain Computers, C-12, Mtn. Stn. Group Box, Nelson, B.C., Canada V1L 5P1.

QL's Price Hits Bottom \$99.00 for complete unit

At Plus Computer Response of Sullivan, New Hampshire, the company that purchased the remaining stock of Sinclair QL's (U.S. Version), is apparently attempting to deplete their inventory of some two thousand QL's. They have announced that the QL's price until the end of the year will be \$99.00, which includes the PSION suite of business programs.

Sharp's, Inc. of Mechanicsville, Virginia, has also announced that they currently have units in stock for the new price of \$99. Other QL dealers have similar deals available.

When the current stock of U.S. QLs is depleted, there will be no more units available. Unless Amstrad follows up on the rumor that has been circulating. Reports indicate that they may release a new computer model based on the Sinclair QL's design.

More QL news from the U.K.

Dear Mr. Woods,

Thank you for publishing my letter in the May/June issue of TIME DESIGNS. Since the letter was written, time has moved on, and a few of the statements need to be updated.

1. The "QL compatible" 68000 based Sandy FUTURA machine was seen in prototype form at a recent U.K. Microfair. The machine was running OS9 and occasionally crashed. Rumor has it that the Futura will make its first working appearance with a QDOS compatible operating system as an IBM "plug-in" card rather than as a stand-alone machine. Unlike the THOR machine, the stand-alone Futura will not use existing QL circuit boards within its shell.

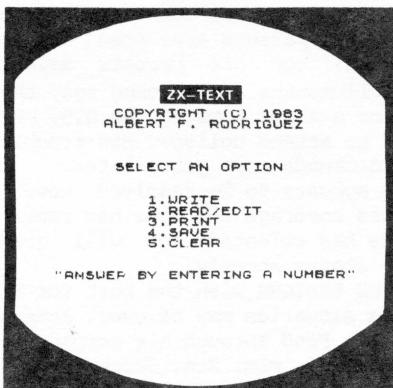
2. The THOR 20 prices in my last letter were relative to the standard THOR prices. In fact, all the prices have changed and they now start at £1179.00! The Thor 20 is regarded as a stop gap machine before CST move away from using the QL circuit board towards a more "pure" 68020 32 bit bus system. It's performance is disappointing for a 68020 system, but it is faster than a QL.

Continued On Page 5.

ALSO AVAILABLE FOR THE T/S 2068

POWERFUL AND INEXPENSIVE BUSINESS SOFTWARE FOR ZX81, T/S1000 and T/S1500 COMPUTERS

ZX-TEXT

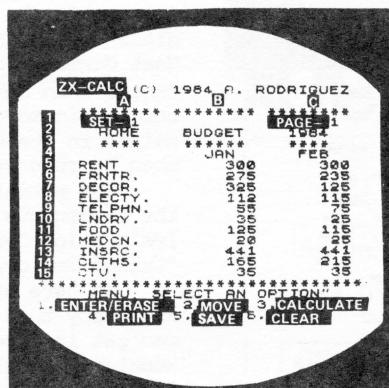


A word processor is to a computer user what a typewriter is to a typist, except that the former has more advantages than the latter. ZX-Text can operate in 16-64K RAM providing from 1300 to 6500 words per document. It features 6 different options: write, read, edit, print, save and clear text. Text is written on a per-line basis with quick speed and with horizontal back-space and delete capabilities being available. You can also access the editor directly from write mode and vice-versa. Text can be proof-read on a per-line basis allowing for enough time to determine if any editing is needed. The text editor allows a line of text to be deleted, inserted, replaced and listed for editing. You may also change a word or expression within a line, stop or start text while it is scrolling up the screen, begin reading text from the first line of the file, re-enter write mode from the editor, return to the main-menu or create a window so that you can read-edit two files simultaneously. The print option takes text displayed in 30-column format on the screen and outputs to either the ZX/TS printer. (With Memotech's Centronics Parallel Interface 80-column and lower/higher - case output is possible.) Files may be saved on tape cassette with the use of one single command, or by the same token they can be erased from memory / storage so that the full capacity of the program can be used for other purposes such as composing letters, reports, articles, memos, standard forms, instructions, ads, graphs, telephone directory, lists of customers, members, friends...etc. Also copies of files are always less expensive and easier to run than using a photocopier. Other advantages are savings in time, paper, ink, correcting mistakes and adding afterthoughts more efficiently than doing them through either handwriting or using a typewriter.

\$16.95

\$3.00 SHIPPING AND HANDLING/PROGRAM

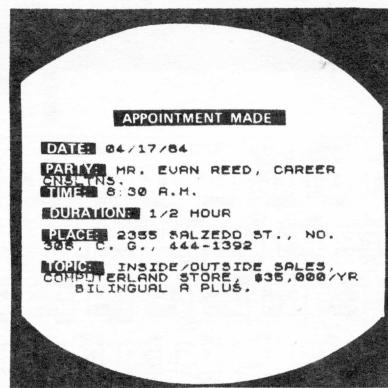
ZX-CALC



An electronic spreadsheet calculator is the fundamental basic tool for summarising, reporting and analyzing in matrix form any accounting, mathematical or scientific manipulation of numbers. ZX-Calc operates in 32-64K RAM and affords a maximum of 3360 characters/spreadsheet. The entire matrix consists of 15 columns (letters A-O) and 30 rows (numbers 1-30) with 8 characters/cell. Unlike other popular ESCs, ZX-Calc uses in calculations and within cells all 14 math functions on the ZX-81/TS1000. It offers a unique "SUM" function that totals one or more rows/columns simultaneously. Parenthesis can be used within equations. There is no fixed limit on how many equations may be entered. Formulas may be stored in all 420 cells of the spreadsheet. The display affords 15 rows/columns. Loading of data into more than one cell can occur across/down one or more row/column simultaneously. With vertical windowing you can arrange a set of columns in any order, or practice using fixed-variable-alignment display formats. The menu offers 6 options: enter/erase, move, calculate, print, save and clear the spreadsheet. Enter/erase allows the entering, deletion or data alignment within a cell through the use of a mobile cursor. With the move option you may move around the entire spreadsheet to access any row, column or cell. The calculate option allows you to enter labels, values or formulas into a cell or write and enter equations that will act upon the data already within the spreadsheet. You can also enter bar graphs into a cell in this option. Absolute/relative replication, down/across a column/row, is also allowed by this option. Also this option allows the automatic calculation of the entire spreadsheet with one single command. Print allows you to output to either the ZX/TS printer the entire spreadsheet by column-sets and row-pages through use of the COPY command. The entire spreadsheet may be saved on cassette tape or you may clear all data from it or erase the program from RAM entirely. The most salient advantage provided by an ESC over specifically vertical applications software is that an ESC provides a reusable framework with which you can compose any specific financial model rather than just be limited to only one statically fixed format for storing, displaying and manipulating numerical data.

\$16.95

ZX-CALENDAR



Time management is an important aspect of any serious business and personal agenda. Planning how to spend our time leaves us better prepared before and while we are spending it and we remain better organized after we finish spending it. ZX-Calendar operates in 16-64K RAM affording 25 appointments in 16K, 100 in 32K or 180 in 48K and 64K. Each appointment record holds a maximum of 220 characters. The main menu includes enter, search/check/sort, change, save, clear and print any and all appointments made on a specific date or with any party. Output to either the ZX/TS printer is permissible. This program will permit you to remember to do something or to be somewhere important by cataloging your answers to six questions that you must account for in order not to waste time when it is scarce: when, with whom, at what time, for how long, where and what are you going to discuss and conclude when you get together with someone else? The program lets you permanently originate, record, classify, search, sort, calculate, modify, summarize, obtain a written report and store your answers to the preceding questions so that you will not forget what you decide to do with your time. This program identifies your time according to when you are going to spend it and with whom you are going to share it. Through these forms of labeling appointments you are able to verify or modify how your time is budgeted without wasting ink, paper or more time trying to remember what you said to yourself or what someone else said to you or where you placed certain written messages that you now can't find. With this program you will know where you can find exactly what you need to know about where you want to and have to be, or where you have been, before you get and after you got there. Thus, ZX-Calendar will let you plan your time so that you will never have to worry about what is ahead or what came before, for you will always know, by using it, to never be caught astray by any time-frame.

\$16.95

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FLORIDIANS ADD SALES TAX

3. QRAM Utilities (the Futura front end) did not originally work with programs compiled with the TURBO and SUPERCHARGE SuperBASIC compilers. After some heated discussion between QJump and Digital Precision, D.P. modified the extensions file, which apparently contained an incompatible "cursor on" command. Unfortunately, SuperBASIC programs compiled with earlier compilers than Turbo 1.42, will still not work with QRAM. Hopefully, software houses working in SuperBASIC will upgrade to the new systems.

4. QRAM contains code which effectively extends the operating system QDOS rather than SuperBASIC. The code provides a window/pointer system for re-sizeable/movable non-destructive windows. A main menu can be windowed on screen by hotkey (press ALT /) at any time. A pointer can then be moved over a vertical submenu (Files, Jobs, Channels, Print, Window dump, Options) and SPACE or ENTER pressed. A "grabber" utility which limits the memory a program can take, and an "Unlock" utility which makes windows destructive, are included. The programs you have in memory can then be flipped through with CTRL C. QRAM is best used with 640K or 896K QL systems.

5. The Miracle Systems TRUMP CARD, offering an additional 768K RAM (896K total), and a disk interface with Toolkit 2, is now available for under £200. It is rumored that Sandy are working on an answer to this card, but time will tell.

6. Digital Precision's DESKTOP PUBLISHER 2.00 is much improved over version 1.00, though Thor owners should still check compatibility before purchase.

7. APT (Adventure Programming Tool) from Shadow Games has caused something of a stir in adventure circles. It supports graphics in mode 8 and text in mode 4 at the same time on screen. It also works in real time and uses multi-task fill routines. Some of the current adventures are being re-written using APT, because of its advantages over the Quill Adventure Writer. APT 1.50 is the latest version.

8. A few people in the U.K. have recently been tinkering with Transputers. A T800 Inmos floating point Transputer will comfortably out-perform a 68020/68881 Motorola combination on its own. One enthusiast is designing a QL/Transputer interface for £75 (Transputer not included). He has succeeded in linking a Transputer to a QL through a Medic interface, no software though.

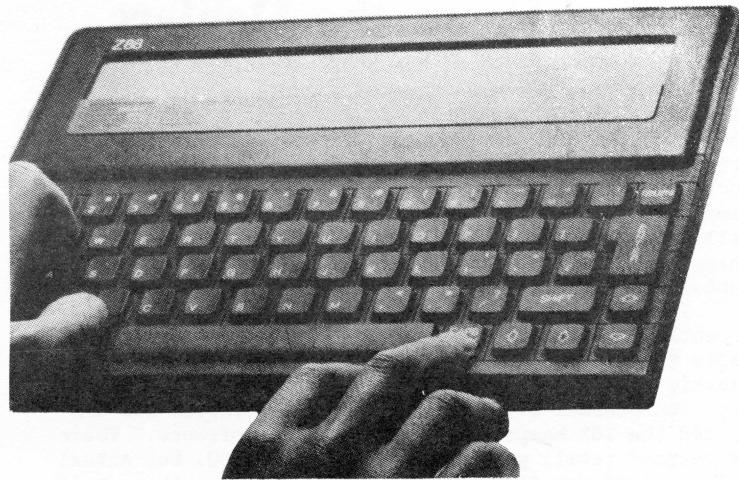
9. New adventures to be released shortly include "The Prawn", said to be a send up of its close name sake, and "Talisman".

10. Having bought the QLiberator 3.11 SuperBASIC compiler, I thought a good test might be to compile a radio satellite location program written in BASIC for the Sinclair Spectrum (TS2068). The program, which was laced with GOSUB's and GOTO's compiled the first time with no errors, but a few warnings about incompatible BASIC commands did arise. On a bench test, a routine to draw the map of the world and then print the names of all available satellites and point to their locations, took 1 minute 55 seconds in SuperBASIC and 17 seconds compiled!

Sincerely,
Richard Howe
ARK DISTRIBUTION
Corve Farmhouse, Chale Green
Ventnor, United Kingdom
PO38 2LA

Sir Clive's Z88 Update

Sir Clive's latest microchip wonder is out now (for real), and the reports coming in, are that it does live up to expectations. Both Mark Steuber of Sharp's Inc., and Rob Curry of Curry Computer have had Z88's to test. Rob Curry reported to TIME DESIGNS that the resident software is very good, the display clear and readable, and overall an impressive machine. Drawbacks may be the lack of a data storage system other than RAM Cartridges (up to 128K), the choice by Sinclair to use BBC BASIC as



a resident language (how about Sinclair BASIC or SuperBASIC?), lack of an internal modem, and the rather steep price tag...the retail price took a £100 jump to £399. Rob Curry also discussed the possibility of uploading and downloading data from a Sinclair QL via the Z88's built-in RS232 port. I/O software for the IBM PC will be released shortly for this purpose on either 5½ or 3½ inch disc. An external modem is being developed and is tentatively priced at £99.95.

Negotiations are currently being conducted between a U.S. dealer and CAMBRIDGE COMPUTER LTD to obtain a U.S. dealership for the Z88. As of this writing, reps from Cambridge will not offer reasonable profit margins for the computer to be competitively priced. The Z88 will need to compete with other battery-powered laptops like Tandy's Model 100.

Interested readers can write to: Cambridge Computer Ltd., Cambridge, England CB4 1BR. Also, SECTOR SOFTWARE (39 Wray Crescent, Ulles Walton, Leyland, Lancashire PR5 3NA) can obtain the Z88's, and is a reliable company to deal with. Direct your correspondence to the attention of David Batty, and mention TIME DESIGNS.

Dates to remember:

* September 26, 1987 *
THE GREAT N.W. TIMEX SINCLAIR MINI-FAIR
Seattle Masonic Temple
801 E. Pine St.
Seattle, Washington 98122
9:00 am - 6:00 pm
\$3 admission at the door.
For further info:
TDM
29722 Hult Road
Colton, OR 97017
(503) 824-2658

* March 7-9, 1988 *
SUNSTATE TIMEX SINCLAIR WINTERFEST
Orlando Marriott
8001 International Drive
Orlando, Florida 32819
For further info:
Mary-Lynn Johnson
249 N. Harden Ave.
Orange City, FL 32763
Sunstate BBS: (904) 775-0093 (7/1/E)

* June 23-26, 1988 *
SILICON VALLEY TIMEX SINCLAIR COMPUTER FEST
South Bay Area/Northern California
(Exact location un-confirmed at press time.)
For further info:
Bob Orrfelt
3436 Bay Road
Redwood City, CA 94063

Continued Next Page.

News From the Dealers

CURRY COMPUTER (P.O. Box 5607, Glendale, AZ 85312, phone 602-978-2902) has acquired a large amount of all brand new TS1000/ZX81 merchandise. Such items include the Timeworks Computer Control Center \$19.95, Mindware Printers \$24.95, and T/S BASIC books \$3.95. The folks at Curry also found some brand new TS1000 computers and 16K Rampacks sitting all alone in a warehouse. They are selling both for \$34.95 plus \$4 S&H. Call or write for shipping charges for individual items. Also, prices quoted are "sale prices" and are subject to change.

Is there a resurgence of interest in the TS1000? Recently, the HOME SHOPPER CLUB, those zany folks on cable television networks who are ready to snatch your plastic money, put up for sale a computer "package". Yep, you guessed it...the computer was a TS1000 and included the 16K Rampack and some Timex software. Their "suggested retail price" was a whopping \$200, but actual "club price" was \$50. But would you believe they sold over 1000 packages!! Folks, it's time to get out your back issues of SYNTAX, and dust off the ol' TS/ZX.

BUDGET ROBOTICS & COMPUTING (Box 18616, Tucson, AZ 85731) now stocks ZX81/TS1000 spare parts, including: the ULA chip (IC1), 64K ROM, membrane keyboard, 5 and 8 way PCB keyboard connectors, case screws and rubber

BUDGET ROBOTICS & COMPUTING (Box 18616, Tucson, AZ 85731) now stocks ZX81/TS1000 spare parts, including: the ULA chip (IC1), 64K ROM, membrane keyboard, 5 and 8 way PCB keyboard connectors, case screws and rubber feet. Budget Robotics' obtains these parts from England to support their robot-building clientele. Write for a price list.

Have you seen the TS1000 clone that AMERICAN DESIGN COMPONENTS (62 Joseph St., Moonachie, NJ 07074, phone 800-524-0809) is selling for \$29.95 (+ \$5.99 for S&H)? The clone has been advertised as being "compatible with the Timex 1000". Actually, only a small amount of TS software will load. SILICON MOUNTAIN COMPUTERS (C-12, Mtn. Stn. Group Box, Nelson, B.C., Canada V1L 5P1) has a solution! Fred Nachbaur has developed an interpreter ROM for the PC8300, that will allow approximately 99% of the Timex software to load. Everything but the newest high-resolution software, but Fred is working on that one too! The price of the new EPROM kit is \$14.95 ppd. (U.S. funds).

Speaking of the PC8300 Timex "clone", it's gaudy green color has earned it the nickname, "Green Hornet".

WMJ DATA SYSTEMS (4 Butterfly Dr., Hauppauge, NY 11788, phone 516-543-5252) has acquired the publishing and marketing rights to THOMAS B. WOODS' programs: ZX PRO/FILE and PRO/FILE 2068. Prices for the software packages are \$19.95 and \$29.95 respectively and include the original manuals written by Thomas Woods. ZX Pro-File is the most comprehensive database ever written for the TS1000/ZX81. Pro/File 2068 was a complete re-write for the TS2068, and offers more features than the ZX version. Thomas Woods has now gone on to write both a successful database program for the IBM PC called FINDEX and PC oriented articles for magazines.

Take note that NOVELSOFT has a new address and phone number: 35 Candle Liteway, Willowdale, Ontario, Canada M2R 3J5, phone 416-665-0290. David Ridge recently turned over the company to his partner, Ariel Frailich, due to a move and a career change. We are glad to see this excellent software house will continue to market their Timex Sinclair programs.

CHIA-CHI CHAO (73 Sullivan Drive, Moraga, CA 94556) will send you his latest product catalog for the TS1000 and TS2068 (also the Aerco FD-68 disk system), if you send in a legal SASE.

Another catalog available for the TS1000 and TS2068 is available from T & C SERVICES (20 Liberty Terrace, Buffalo, NY 14215, phone 716-834-1716). We were quite impressed with the large variety of software titles featured in this catalog. Write for your copy.

LEMKE SOFTWARE DEVELOPMENT (2144 White Oak, Wichita Kansas, 67207) announced that they are publishing a FREE quarterly newsletter for users of their new Desktop programs. To receive your copy of the PIXEL PRINT PRESS newsletter, send 4 legal SASE to Lemke Software. The "Pixel Print Press" will feature hints, tips, new icons, and user news...and you don't even have to own the Pixel Print software to subscribe.

Remember the Rotronics WAFADRIVE? While supplies last, you can now buy one for £18.00 (around \$30.00 U.S.) from a company in England: LOGIC SALES LTD., 17 Leofric Square, Eastern Industry, Peterborough, Cambs., England. This is a special "close-out" deal. The Wafadrive is Spectrum system, and requires both an emulator and a "twister" board in order to operate it on the TS2068. A&J wafers will work on the Rotronics.

A&J MICRODRIVE is now called "A&J Assembly". There is also a new address and phone number: 2042 Aiello Dr., Suite "C", San Jose, CA 95111, (408) 281-0100.

Mike de Sosa's new book "TAKING THE QUANTUM LEAP: THE LAST WORD ON THE SINCLAIR QL" has received favorable comment from Europe. Watch for upcoming reviews in QL WORLD Magazine and QUANTA User Group Newsletter. The book is exclusively published and marketed by TDM (29722 Hult Rd., Colton, OR 97017, phone 503-824-2658).

Reports are, that Larry Kenny of LARKEN ELECTRONICS (RR#2 Navan, Ontario, Canada K4B-1H9), may be modifying designs on his RAMdisk memory upgrade for the Timex Sinclair 2068. Internal banks of RAM may be used rather than the original designs first suggested, and also less RAM than the original 256K. Regardless, Larry needs to hear from TIME DESIGNS readers if you are interested in additional memory for your TS2068. This is a valuable project, but will need to have substantial support and interest to be a success. Drop Larken a postcard, if you would like details on RAM upgrades for your computer.

Great TS User Groups --check them out!

Have we listed your group's information lately?
Send us the club's name/address for publication.

Get noticed. Bring in new members!

Dallas Timex/Sinclair/Amstrad Users Group
P.O. Box 153421
Irving, TX 75015

Harrisburg Area Timex Sinclair Users Group
c/o Dave Bennett
329 Walton St. (Rear)
Lemoyne, PA 17043

Vancouver Sinclair Users Group
c/o Rod Humphreys
2006 Highview Place
Port Moody, B.C.
Canada V3H 1N5

Indiana Sinclair-Timex Users Group
c/o Frank Davis
513 E. Main St.
Peru, IN 46970

Long Island Sinclair Timex User Group
P.O. Box 438
Centerport, NY 11721

Capitol Area Timex Sinclair Users Group
P.O. Box 467
Fairfax Station, VA 22039

Fort Worth Timex Sinclair User Group
4424 Geddes Ave.
Fort Worth, TX 76107

Herb's BASIC "One-Liners"

Herb Bowers, Sr

Here are a couple of nifty one-liners from the "ABBA SOFT Super Sub Shop", that some of you may be interested in. "We gotta million of 'em folks" and from time to time we would like to share them with you.

There are a few draw backs in the use of PAUSE 0 on the TS2068. First of all, PAUSE cannot be released with the joystick button, and second, if you are using a color TV for your monitor, you get a lot of distortion in a color program display during PAUSE.

On the TS1000 PAUSE 0 can be simulated with PAUSE 4E4, but the disadvantage is the annoying "jump" when any PAUSE is used.

On multi-player games on the TS2068, a function is activated by a player using a key or button (to activate a one armed bandit, spin or stop a "wheel", etc.). It is necessary for all participants to hover over the keyboard waiting for their turn. It is so much better to have one player at the keyboard making the needed keyboard entries and the other player(s) using a joystick button to initiate their turns.

The system I use on my TS2068 is a one line "catch all" simulated PAUSE 0 sub-routine, that not only allows release with the right or left joystick button, but also from the keyboard, along with a "count down" timer option.

PSEUDO PAUSE 0 SUB:

```
1 FOR f=0 TO 1: LET f=1*  
STICK (2,1) <>0 OR STICK (2,2) <>0  
OR INKEY$=" " : NEXT f: RETURN
```

After you have keyed-in the above line, enter as a direct command GOSUB 1. Now press either the right or left joystick button or the space bar. You will get an "ok" code at the bottom of the screen. You can change the INKEY\$=" " to any character you want, to release the pause, or to INKEY\$=CHR\$ 13 and only ENTER will release the pause.

If you are a little "heavy fingered", you can put a delay in using the following instead.

PSEUDO PAUSE 0 SUB WITH DELAY:

```
1 FOR f=1 TO 20: NEXT f: FOR  
f=0 TO 1: LET f=1* STICK (2,1)  
<>0 OR STICK (2,2) <>0 OR INKEY$=  
" " :NEXT f
```

Perhaps you had better type in the following test module to illustrate this.

```
100 GOSUB 1:PRINT "ok":GOTO 100
```

Now enter the command GOTO 100.

There are times when it is nice to have a count-down timer to limit the amount of time the player has to make up his/her mind. Try the following.

PSEUDO PAUSE 0 SUB WITH TIMER:

```
1 LET t=11:FOR f=0 TO 1: LET  
t=t-.041:PRINT AT 0,0;INT t;" "  
LET f=1* STICK (2,0) <>0 OR STICK  
(2,1) <>0 OR INKEY$=" " OR t<0  
: NEXT f:RETURN
```

This gives you a 10 second count down. To change count-down time, change the value of "t" in the first statement to 1 more than the number of seconds you want. The decimal -.041 can be adjusted to speed up or slow down the count according to your area, program length or the heat and humidity. Use the same test routine as above to test this sub.

Ok, now for the good old TS1000. I don't have mine anymore (sure wish that I did), but here is the one-liner for a pseudo PAUSE 0 without the "jump". Sure you can accomplish it with a FOR/NEXT loop, but that takes a minimum of 3 lines. Let's do it with one.

```
NO JUMP PAUSE 0 FOR THE TS 1000
```

```
10 GOTO 10+ (INKEY$<>"")
```

That's it! Now RUN [ENTER]. See it really works. The above routine will drop thru to the next program line. Always change the numeric value to the line you put the routine on.

So maybe you don't want to drop to the next program line. Let's say that you want to skip to line 100. Ok! Use the following.

```
10 GOTO n+((INKEY$<>"")*n2)
```

In the above, n=current line. n2=line to be jumped too -n. So you want to jump to line 100 from line 10, then make n=10 and n2=90...

I really hope that you can put the above one-liners to good use. Let us know if you would like to see more. Editor: Herb Bowers is chief owner and programmer for ABBA SOFT. Write to him c/o TDM or direct to: 2588 Woodshire Circle, Chesapeake, VA 23323.



Get Lucky

Bill Ward

With many states now offering lotteries, the desire for help in making your selection of a "good" number is probably universal. The following short program for the TS2068 will select 6-digit "lucky" numbers in a rather unique way.

The variables: n, y, z, a, b, and c, are the 6 digits we are seeking. However, each is randomly varied from 0 to 9 in lines 150 to 200. At the same time, variable "f" is randomly varied from 0 to 6 in line 130. Now as the loop (line 140 to 250) operates, "x" is trying to match "f" while the n, y, z, a, b, c, variables are merrily changing values randomly, and when "f" does match "x", then the super-randomly selected number appears!

After the listing is completed, try it out. From time to time, the program will stop with an error code, therefore you must enter the following:

```
210 ON ERR GOTO 130
```

Now BEFORE you RUN this, you must SAVE it! Otherwise once you run the program with line 210 in place, it will not SAVE, nor can you LIST it.

Hopefully those who WIN using this program will send me a postcard at: P.O. Box 556, Grand Island, FL 32735, telling me the good news! GOOD LUCK!

```
5 REM © Bill Ward 9/1/87  
10 PRINT TAB 4;"LOTTERY NUMBER  
SELECTOR".  
20 PRINT : PRINT "Random selec-  
tion of 6 digits"  
30 PRINT : PRINT "Run until ju-  
st one","number is printed!"  
40 DIM a$(10)  
50 RANDOMIZE 0  
60 LET a$="0123456789"  
70 LET f=INT (RND*5)+1  
80 FOR x=1 TO f  
90 LET n=INT (RND*10)  
100 LET y=INT (RND*10)  
110 LET z=INT (RND*10)  
120 LET a=INT (RND*10)  
130 LET b=INT (RND*10)  
140 LET c=INT (RND*10)  
150 IF x=f THEN PRINT AT 12,12;  
a$(n)+a$(y)+a$(y)+a$(a)+a$(b)+a$  
(c),  
160 BEEP .15,5: BEEP .15,5: BEE  
P .15,5  
170 IF x=f THEN BEEP .15,5: BEE  
P .15,5: BEEP .15,5: BEEP 1,10  
180 NEXT x  
190 PRINT AT 14,6;"YOUR LUCKY N  
UMBER!"
```



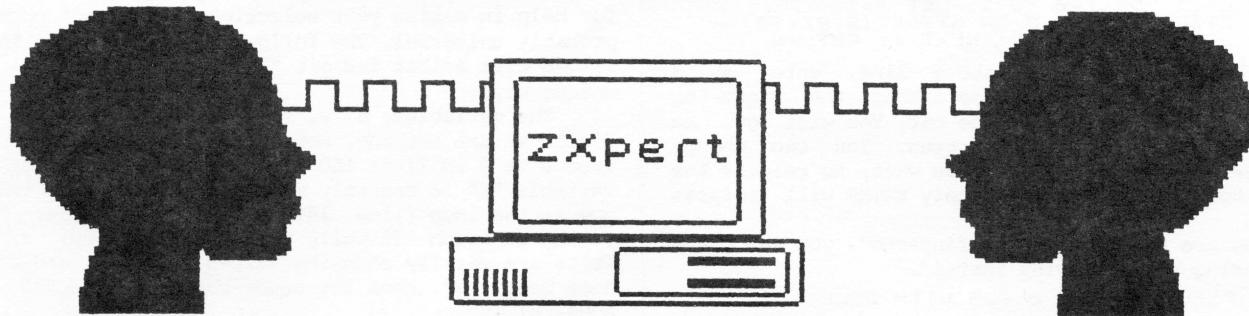
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WHICH SYSTEM DO YOU USE?

Reader Tips and Hints for Mass-Storage

Do you sometimes feel all alone out there with some very sophisticated (even complicated) disk drive system or other mass storage device? There have been more types and designs of storage for Sinclair computers than one can count on ten fingers. This new forum is for you and it's success depends on how much participation we receive.

Two specialty newsletters that catered to disk drive systems ("T.O.P.S." and the "FD-68 User") have folded, leaving many users out in the cold. We hope this "hints and tips" column will help fix this situation.

Send us your tips, hints, short program listings or whatever you might have that pertains to disk drives, microdrives, wafadrives, even cassettes, and we will print as many as possible. This is NOT a TS2068 column only. So TS1000 mass storage system owners get your printers warmed up to, and send in your tips. Spectrum and QL owners too!

ZEBRA/TIMEX FDD DISK SYSTEM

Doug Gangi

DISK HANDLER

This program makes some of the more commonly used commands of the Zebra FDD system easier to use. I created this program one day as I got so tired of trying to delete a block of programs off one of my disks. I decided that things would be so much easier if I could make a program to handle some of the commands such as Erase, Move, Format, etc. This program will make life easier for you if you want to move programs from one disk to another, format, rename, and erase programs. It is a short (and quite crude) program so feel free to customize the program in any way your heart desires.

```
10 POKE 23658,8: BORDER 0: INK
7: PAPER 0: CLS
20 PRINT FLASH 1;""
DISK HANDLER
30 PRINT "////"Menu:"/"1) Erase programs"/"2) Disk to disk transfer"/"3) Format"/"4) Rename file"
35 PRINT "5) Catalog"
37 PRINT "6) Quit"
40 INPUT "Choice? ";a: IF a>=1 AND a<=6 THEN GO TO 100*a
50 GO TO 40
100 CLS : PRINT "ERASE PROGRAMS"
110 INPUT "Disk A or B? ";a$
120 GO TO *a$d
130 CLS : CAT *
135 PRINT #1:AT 0,0;"HIT A KEY!
": PAUSE 0
140 PRINT AT 15,0;"Which program? (just hit ENTER to return to main menu or CH to switch drives or C* to CAT)"
150 INPUT n$: IF n$="" THEN RU
N
160 IF n$="CH" THEN GO TO 110
165 IF n$="C*" THEN GO TO 130
170 ERASE *n$
180 GO TO 140
200 CLS : PRINT "DISK TRANSFER"
"////"1) From A to B"/"2) From B to A": INPUT q
210 IF q=1 THEN GO TO *a"d: I
INPUT "Name of disk B?";h$: GO TO
230
```

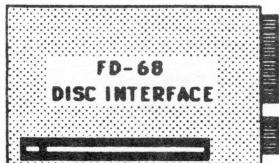
```
220 GO TO *"b"d: INPUT "Name of disk A?";h$
230 CLS : CAT *: PRINT #1:AT 0,0;"HIT A KEY": PAUSE 0
240 PRINT AT 20,0;"Which program? (ENTER to stop)"
245 INPUT n$: IF n$="" THEN RU
N
250 MOVE *n$ TO ":"+h$+":+n$
255 IF q=1 THEN CLS : GO TO *"b"d: CAT *: PRINT #1:AT 0,0;"HIT A KEY": PAUSE 0: GO TO *"a"d: G
O TO 260
256 CLS : GO TO *"a"d: CAT *
257 PRINT #1:AT 0,0;"HIT A KEY"
: PAUSE 0: GO TO *"b"d
260 GO TO 230
```

```
280 PRINT #1:AT 0,0;"HIT A KEY"
: PAUSE 0
290 RUN
300 CLS : PRINT "FORMAT"
310 INPUT "Format disk in A or B? ";h$
320 INPUT "Name? ";n$
330 FORMAT *n$ TO h$
340 GO TO *h$d: CAT *
350 PRINT #1:AT 0,0;"HIT A KEY!
": PAUSE 0: RUN
400 CLS : PRINT "RENAME"
410 INPUT "Drive A or B? ";g#
415 GO TO *g$d: CAT *
420 PRINT #1:AT 0,0;"HIT A KEY"
: PAUSE 0
430 INPUT "Program? (ENT to quit)":n$
435 IF n$="" THEN RUN
440 INPUT "New name? ";m$
450 LET *n$ TO m$
460 GO TO 430
500 INPUT "Drive A or B? ";g#
505 CLS
510 GO TO *g$d: CAT *
520 PRINT #1:AT 0,0;"HIT A KEY"
: PAUSE 0: RUN
600 STOP
```

A TIP FOR THE OLD, SILVER TIMEX DRIVES

One of the problems with the old Timex disk drive system is that the power supply gets extremely hot using 2 drives. The most common way to solve this problem is to buy a muffin fan (but at \$20, that's also an expensive way!). Being a Frugal McDougal myself, I decided there had to be a less expensive way. And I found it in my storage room...the drill. So, why not put a few holes in the case for better ventilation (the only portals for cooling in the Timex power supply are in the top and on the back...not too good).

If you turn over the power supply, you will see the 4 rubber feet. Remove these and you will see the screws that hold the case together. I drilled my holes on both sides of the case toward the rear (where the heat sink lies). I drilled 12 holes on each side. For more breathability, I also drilled more holes on the bottom of the case. When you reassemble the power supply, you may find it looking somewhat like swiss cheese, but you won't find that the power supply overheats and you won't have to spend \$20 on a noisy fan.



AERCO FD-68 DISC SYSTEM

Mowgli Assor

This article is mainly for those of you who like to tinker, and a knowledge of Z80 machine code is very helpful. It is also helpful if you have HOT-Z 2068, ZEUS Assembler, or some other assembler package.

The routines that are listed, took me about 3 weeks to perfect! This shows that doing the code to actually access the disc is VERY finicky. The routines have been tested on ROM revisions 8.8 through 8.9, so if you have these ROM revisions and the routines don't work, the first thing that you should check is whether anything was mistyped.

Before actually accessing the routines, it always helps to actually turn on the drive! This is NOT done automatically. Calling 3542h will turn on drive A, 3547h will turn on drive B, etc.

When actually accessing the sector routines, you first need to set up certain registers with the drive parameters. The following parameters are required:

```
LD B,<Track number>
LD C,<Sector number>
LD HL,<Buffer address>
```

After loading up these parameters, and loading chunk 1 from the dock bank, you can CALL 3556h for read or CALL 3568h for write.

The following is a rough flowchart showing how a routine would read a sector off of disc. Following the flowchart is the routine in Z80 assembler code.

```
-----  
-- START --  
-- Do IN 244 --  
-- Save result for later --  
-- Do OUT 244 with chunks --  
-- 0 & 1 enabled --  
-- CALL 3542h to turn ON drive --  
-- LD registers B, C, & HL --  
-- with parameters --  
-- CALL 3556h to READ sector --  
-- CALL 3582h to turn OFF drive --  
-- RETurn to BASIC code --  
-----
```

The Z80 assembly code goes something like this:

```
PUSH AF ; \> Save stuff for
PUSH BC ; / the return
PUSH HL ; / keep bank status
IN A,(F4h) ; for later
PUSH AF ; Make sure to set
OR 3 ; chunks 0 & 1
OUT (F4h),A ; Enable chunks

-- If needed, the change side --
-- select routine goes here --

CALL 3542h ; Switch drive A ON
LD BC,01 ; Load B = track,
; C = sector
LD HL,5A00h ; Load HL = buffer
; address
CALL 3556h ; Read 1 sector
CALL 3582h ; Turn drive A OFF
POP AF ; Set things back
OUT (F4h),A ; to normal
POP HL ; \> Get stuff back
POP BC ; / for RET
POP AF ; / for RET
RET
```

To use the above routine to write instead of read, change the "CALL 3556h" to "CALL 3568h". The parameters should, of course, be set up exactly the same way. To use a different drive, change the "CALL 3542h" above to "CALL 3547h" for drive B, 354Ch for drive C, or 3551h for drive D.

The above routine works well for a single-sided drive, but what about side 2 (side 1, according to the AERCO I/F itself)? A little bit must be added to the above routine to account for changing sides.

This is the change side select routine:

```
LD A,1 ; LD A with
; side select
; 0 for side 1,
; 1 for side 2
LD (3FEBh),A ; Set it up
```

When this routine is executed, chunk 1 MUST be enabled, as otherwise you will be trying to write to ROM. 3FEBh translates into 16363 decimal, and you may wish to PUSH AF in the above routine and then reload the side select before you RETurn to BASIC.

In using the routines, I have found it the easiest to POKE the parameters into the machine code routines, and then RANDOMIZE the above routines.

Enjoy, and keep Timex-ing!

OLIGER SAFE DISK SYSTEM V2.2

Dick Wagner

This report updates my article on the OLIGER SAFE DOS V2.1 System (see TDM Jan/Feb '87) to the current V2.2 system.

There is now a MOVE /"FILENAME" TO n command, to transfer an individual file from one disk to another drive. (Even with my combination of 3" and 5 $\frac{1}{4}$ " drives.) Now you can unmix various files and put them in order as explicit groups.

VERIFY will find a file by name and check the data for any errors. There is also an auto-VERIFY that goes into action on each SAVE.

Another improvement is in making FORMAT and MOVE quieter, as now only one pass of the head is required.

This is an unusual bit of news: another DOS (not Kingsley's) is out on the market that works with the Oliger system. Abbeydale Design's SPDOS is available and works as the Ramex system did. Thus files made on a Ramex system can be used with the Oliger SAFE system. Some RAM is used as about 4K of memory is required. Details on the SPDOS are available by writing to the John Oliger Company (11601 Whidbey Dr., Cumberland, IN 46229).

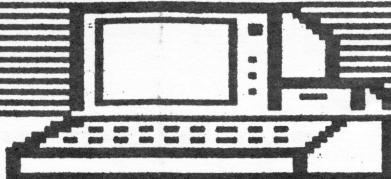
A MERGE /"FILENAME" command is being promised, even though the SAFE DOS EPROM is getting rather full. It is possible that use will be made of BRAM for some future commands.

The John Oliger Company now has two software improvements available: one helps select SAFE routines from Machine Code, and also a great index program that works in /0 file (1 1/2K). This program reads the CATALOG names and the user has an arrow to move to the selected file and on ENTER, the program is loaded. No more listing file names! A neat way to keep that index current. Any time a file is saved, the program just reads the added name. However, only the file name is displayed and not the other information that CAT displays. If there are several files with the same name but saved as BASIC, CODE, DATA, etc., then CAT must be used also.

The index program is part machine code and is fast. At first I was using this program on a disk without files, so it really didn't show much. Then when I put the program onto a disk with files, it was apparent how

THE X-SINCLAIR SOFTWARE

WMJ Data Systems
4 Butterfly Drive
Hauppauge, NY 11788



The Best Are Back!

As many Timex-Sinclair fans know Thomas B. Woods has written some of the best software packages available for their machines. It is now our privilege to bring them to you.

Mr. Woods has written what most consider to be the best data base programs for the Timex-Sinclair line. First he wrote ZX Pro/File for the Sinclair ZX81 and the Timex-Sinclair 1000/1500. A couple of years later he wrote Pro/File 2068 for the Timex-Sinclair 2068.

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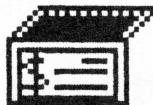
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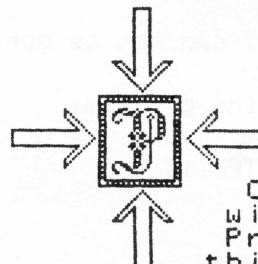
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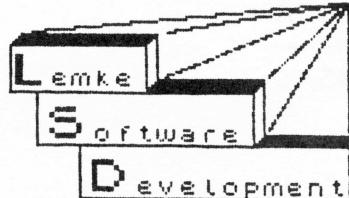
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Memory/Trace Using Interrupt Mode 2

by Floyd Chrysler

Having a Z80 processor in the Timex 2068 gives the user a powerful suite of instructions to use. One of the most useful is IM2. This instruction allows the user to divert interrupts to their own routines to do almost anything imaginable.

In normal operation the processing is interrupted 60 times a second so the CPU can update the screen and read the keyboard. The CPU then returns to the next instruction it was to have executed if an interrupt had not occurred. IM2 allows us to assume control and execute some instructions before returning from the interrupt.

The problem with using IM2 in the 2068 is that the Z80 assumes that an interrupting device will place one byte of data on the data bus. It then combines this byte with the I register to form an address. At this address it expects to find a second value, the routine address to which control is to be passed.

In the Spectrum this works very nicely, as the data bus always contains 255 (FFh), due to the way the hardware was designed. A person wanting to use IM2 can always count on the value being placed in the I register will be concatenated with FF to form an address. With the 2068, at the time of an interrupt, the data bus will have any value from 0 to 255. This makes it impossible to predict what will be combined with the I registers.

In the Sept/Oct 1985 Sinc-Linc (from the Toronto Timex-Sinclair Users Club) Bob Mitchell suggested that by setting aside 256 bytes, for a vector table, IM2 could be effectively used. By loading a vector table with the same byte, no matter what value was found on the data bus, it would find the proper routine address.

With this thought in mind, I dug out some old code I had been working on to provide a constant display of how much memory was available and a trace of basic program line numbers. I set up the routine to load a vector table and initialize IM2 upon entry. The routine will start by displaying the amount of free space available. By pressing enter and K, at the same time, the routine will switch to display line numbers as your Basic program runs. A delay has been built in so the line numbers can be read, you will notice a slowing down of your program's execution. By pressing enter and J, at the same time, the routine will return to displaying free space. To stop the routine completely press enter and L at the same time. To start the routine or restart after pressing enter and L use RANDOMIZE USER 65281.

I have provided a Basic program to load the code. Type it in and save it before running. Once keyed in, and saved, run the program to poke the code into memory. Save the code using Save "memtrace" CODE 65021,464. To start the routine use RANDOMIZE USER 65281. Any keying errors may cause your machine to crash so double check the data statements very carefully.

I hope that this routine gives you a good example of how IM2 can be used and spurs you on to develop some good routines to share here.

continued next page

SOLUTION OF THE PUZZLE OF THE MONTH

We will assume the bag to contain x pennies, y dimes and z halfdollars. There can not be less than 10 pennies (the total value of the bag would never come to an even \$5). For the same reason, x can only increment by 10 and the maximum for x is 90.

The number of dimes is limited to 44 so as to leave room for 10 pennies and 1 half-dollar. And it would still not be a solution, since there would be only 55 coins to total \$5!

In a similar reasoning, z can not be more than 9 and probably much less.

Thus we write the following program:

```
10 FOR X=10 TO 90 STEP 10
20 FOR Y=1 TO 44
30 FOR Z=1 TO 9
40 REM SUM: LET S=X+Y+Z
50 REM VALUE: LET V= X+10*Y+50*Z
60 IF S=100 AND V=500 THEN PRINT X;" PENNIES";Y;" DIMES";Z;" HALFDOLLARS"
70 NEXT Z
80 NEXT Y
90 NEXT X
100 STOP
```

In about a minute, your TS2068 will print the answer:

60 pennies = \$0.60
39 dimes = \$3.90
1 half\$ = \$0.50

100 coins = \$5.00

CEDRIC R. BASTIAANS

BASIC Listing

```

10 CLEAR 65020
20 FOR C=65021 TO 65023
30 READ X: POKE C,X
40 NEXT C
50 FOR C=65281 TO 65484
60 READ X: POKE C,X
70 NEXT C
80 STOP
90 DATA 195,28,255
100 DATA 197,213,229,245,33,0,254,6,0,54,253,35,16,251,54,253,6
2,254,237,71
110 DATA 241,225,209,193,237,94,201,255,243,197,213,229,245,1,2
54,191,237,120,254,28
120 DATA 40,28,254,26,40,10,254,22,32,11,175,50,75,255,24,5,62,
1,50,75
130 DATA 255,205,78,255,241,225,209,193,251,201,237,86,24,246,0
191,80,237,91,101
140 DATA 92,33,191,80,34,76,255,58,75,255,254,1,204,187,255,32,
5,42,69,32
150 DATA 24,5,42,178,92,237,82,1,240,216,205,139,255,1,24,252,2
05,139,255,1
160 DATA 156,255,205,139,255,1,246,255,205,139,255,1,255,255,20
5,139,255,201,175,9
170 DATA 60,56,252,237,66,61,198,48,229,205,165,255,33,76,255,5
2,42,76,255,205
180 DATA 178,255,225,201,237,75,54,92,38,0,111,41,41,41,9,235,2
01,6,8,26
190 DATA 119,36,18,16,250,201,6,10,197,1,244,1,33,0,0,17,0,0,23
7
200 DATA 176,193,16,241,201

```

Example Routine

INTERRUPT MODE 2

```

CLEAR 64763 GIVES 484 BYTES FOR ROUTINES
RAND USER 65025 TO START

FCFC - FCFE 64764 - 64766 JUMP ADDRESS
F000 - FE00 64768 - 65024 VECTORS SET TO 'FC'
FE01 - FE1B 65025 - 65051 STARTUP CODE
FE1C - FFFF 65052 - 65535 AVAILABLE

DEFS 64764-ORG
JP 65052 JUMP TO START OF ROUTINE
REM
REM SPACE FOR VECTOR TABLE
REM
REM
INIT DEFS 65025-ORG
PUSH BC SAVE
PUSH DE REGISTERS
PUSH HL
PUSH AF
LD HL,64768 LOAD START OF VECTOR TABLE
LD B,00 SET REG. B FOR LOOP
INC HL LOAD DATA
DJNZ (HL),252 POINT TO NEXT BYTE
LD (HL),252 CONTINUE LOOP
LD A,253 LOAD LAST BYTE
LD I,A LOAD VALUE FOR INDEX REG.
POP AF LOAD INDEX REG. FOR 64768
POP HL RESTORE
POP DE REGISTERS
POP BC
IM 2 TURN ON INTERRUPT MODE 2
RET
DEFS 65052-ORG
START REM

```

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Memory/Trace Using Interrupt Mode 2

Assembly Listing

INTERRUPT MODE 2

```

CLEAR 65020
RAND USER 65281 TO START

FDFD-FDFF 65021-65023 JUMP ADDRESS
FE00-FF00 65024-65280 VECTORS 'FD'
FF01-FFFF 65281-65635 AVAILABLE

65021 DEFS 65021-ORG
65021 C31CFF JP L1 JUMP TO START OF ROUTINE
65024 REM
65024 REM
65024 REM
65281 DEFS 65281-ORG
65281 C5 L250 PUSH BC SAVE
65282 D5 PUSH DE REGISTERS
65283 E5 PUSH HL
65284 F5 PUSH AF
65285 2100FE LD HL,65024 LOAD START OF VECTOR TAB
65288 0600 LD B,00 SET REG. B FOR LOOP
65290 36FD L251 LD (HL),253 LOAD DATA
65292 23 INC HL POINT TO NEXT BYTE
65293 10FB DJNZ L251 CONTINUE LOOP
65295 36FD LD (HL),253 LOAD LAST BYTE
65297 3EFE LD A,254 LOAD VALUE FOR INDEX REG
65299 ED47 LD I,A LOAD INDEX REG FOR 65024
65301 F1 POP AF RESTORE
65303 E1 POP HL REGISTERS
65303 D1 POP DE
65304 C1 POP BC
65305 ED5E IM 2 TURN ON INTERRUPT MODE 2
65307 C9 RET
65308 DEFS 65308-ORG
65308 FF L1 RST 56 DISABLE INTERRUPTS
65309 F3 DI
65310 C5 PUSH BC
65311 D5 PUSH DE
65312 E5 PUSH HL
65313 F5 PUSH AF
65314 01FEBF LD BC,49150 CHECK KEYBOARD
65317 ED78 IN A,(C) READ KEY(S) PRESSED
65319 FE1C CP 28 ENTER AND 'L'
65321 281C JR Z,L5 YES, TURN OFF ROUTINE
65323 FE1A CP 26 ENTER AND 'K'
65325 280A JR Z,L2 YES, TURN ON TRACE
65327 FE16 CP 22 ENTER AND 'J'
65329 2008 JR NZ,L3 NO, CHECK PRIOR SETTING
65331 AF XOR A YES, TURN TRACE
65332 324BFF LD (L6),A OFF
65335 1805 JR L3 GO SHOW MEMORY LEFT
65337 3E01 L2 LD A,01 SET SWITCH FOR TRACE
65339 324BFF LD (L6),A
65342 CD4EFF L3 CALL LB GO DO SERVICE REQUIRED
65345 F1 L4 POP AF
65346 E1 POP HL RESTORE
65347 D1 POP DE REGISTERS
65348 C1 POP BC
65349 FB EI ENABLE INTERRUPTS
65350 C9 RET RETURN
65351 ED56 L5 IM 1 RESET INTERRUPT MODE 1
65353 18F6 JR L4 GO RETURN
65355 00 L6 DEBF 00 ROUTINE SWITCH
65356 BF50 L7 DEFW 20671 SCREEN DISPLAY ADDRESS
65358 ED58655C L8 LD DE,(23653) START OF FREE SPACE
65362 21BF50 L9 LD HL,20671 RESTORE DISPLAY
65365 224CFF LD (L7),HL FILE
65368 3A4BFF LD A,(L6) ADDRESS
65371 FE01 CP 01 TRACE REQUIRED
65373 CCB8FF CALL Z,L17 YES, CALL TRACE ROUTINE
65376 2005 JR NZ,L10 NO, GO TO MEMORY ROUTINE
65378 2A455C LD HL,(23621) CURRENT STATEMENT NUMBER
65381 1805 JR L11
65383 2AB25C L10 LD HL,(23730) RAMTOP
65386 ED52 SBC HL,DE FIND MEMORY LEFT
65388 01F0D8 L11 LD BC,55536
65391 CD88FF CALL L12 CALC. # OF 10,000 BYTES
65394 0118FC LD BC,64536
65397 CD88FF CALL L12 CALC. # OF 1,000 BYTES
65400 019CFF LD BC,65436
65403 CD88FF CALL L12 CALC. # OF 100 BYTES
65406 01F6FF LD BC,65526
65409 CD88FF CALL L12 CALC. # OF 10 BYTES
65412 01FFF LD BC,65535
65415 CD88FF CALL L12 CALC. # OF UNIT BYTES
65418 C9 RET
65419 AF L12 XOR A CLEAR
65420 09 L13 ADD HL,BC ADD NEGATIVE VALUE
65421 3C INC A
65422 38FC JR C,L13 CONTINUE TILL NO CARRY
65424 ED42 SBC HL,BC RESTORE TO CORRECT VALUE
65426 3D DEC A DECREMENT BY ONE
65427 C630 ADD A,48 CONVERT DIGIT TO ASCII
65429 E5 PUSH HL SAVE HL REGISTERS
65430 CD45FF CALL L14 GO FIND DIGIT
65433 214CFF LD HL,L7 INCREMENT SCREEN
65436 34 INC (HL) DISPLAY ADDRESS
65437 2A4CFF LD HL,(L7) GO PRINT DIGIT ON SCREEN
65440 CDB2FF CALL L15 RESTORE HL REGISTERS
65443 E1 POP HL RETURN TO CALLER
65444 C9 RET
65445 ED4B365C L14 LD BC,(23606) POINT TO CURR. CHAR. SET
65449 2600 LD H,0 ZERO REG. H
65451 6F LD L,A LOAD VALUE IN REG L
65452 29 ADD HL,HL DOUBLE
65453 29 ADD HL,HL AGAIN
65454 29 ADD HL,HL AND AGAIN
65455 09 ADD HL,BC GET CHAR. ADDRESS
65456 EB EX DE,HL SAVE IN REGS DE
65457 C9 RET RETURN TO CALLER
65458 0608 L15 LD B,08 MOVE CHARACTER TO SCREEN
65460 1A L16 LD A,(DE) A,(DE)
65461 77 LD (HL),A
65462 24 INC H
65463 13 INC DE
65464 10FA DJNZ L16 LOOP UNTIL MOVED
65466 C9 RET RETURN TO CALLER
65467 060A L17 LD B,10 LOAD DELAY FACTOR
65469 C5 L18 PUSH BC
65470 01F401 LD BC,0500 ROUTINE TO
65473 210000 LD HL,0000 DELAY
65476 110000 LD DE,0000 FOR
65479 ED80 LDIR TRACE
65481 C1 POP BC
65482 10F1 DJNZ L18
65484 C9 RET RETURN TO CALLER

```

ALARM CLOCK



Kenneth Fracchia



Does your TS2068 usually sit on a shelf doing nothing at all? Here is a program just for you. Your computer will be transformed into a full-time digital alarm clock and timer. Unlike most alarm clocks, two separate alarm times can be set, or you can set the alarm times about ten minutes apart, and the later time will act as a "snooze" alarm. Although the alarm times and the current time will be displayed, you do not need a television or monitor to use the alarm feature.

Type the program into your computer and save it using the command GOTO 9999. Now "ALARM CLOCK" will automatically start when you LOAD it. Since you may not be using a display, a BEEP signal will tell you when the program has been loaded. Now you can set the two alarm times and the start time, following the two steps below for each time.

1. Depress ONE of the following letters:

T....to set the Start Time
A....to set Alarm A
B....to set Alarm B

2. Depress the number and letter keys in the order that they would appear on a digital clock. Do not leave spaces, and do not use the SHIFT or ENTER keys. Also, "AM" or "PM" must follow the numerical time.

Any of the above times can be set in any order, and can be changed by setting them again. To use the clock only, it is not necessary to set any alarm times. Depressing CAPS-SHIFT and BREAK together will RUN the program, clearing all previously set times.

Example: The clock will be started at 8:30 PM, and you want the alarms to sound at 7:25 AM and 11:05 PM. Depress the keys as follows--"T830PMA725AMB1105PM".

To use "ALARM CLOCK" as a timer, set the start time to 000PM or 000AM. Set one of the alarm times to the number of hours and minutes to be counted. Example: You want the alarm to sound in 5 hours and 32 minutes. Depress the keys as follows--"T000PMA532PM". The maximum time can not be more than 12 hours and 59 minutes, and, if the starting time is followed by "AM", then the alarm time should be followed by AM too.

If you are not using a television or monitor, you should verify all set times. Depress "VT" to verify Start Time. "VA" and "VB" will verify Alarm A and Alarm B times. The computer will BEEP the number of hours set, one BEEP for each hour. Then, it will BEEP the number of minutes, using a quick succession of ten BEEPS for each multiple of ten minutes, and the remaining minutes will be verified with single BEEPS again. Finally, a high pitched BEEP indicates "AM", and a low pitched BEEP will indicate "PM". Example: Alarm B has been set at 8:35 AM. Depress "VB". If the time was set correctly, you will hear 8 BEEPS, then 3 sets of 10 quick BEEPS, and then 5 more BEEPS. Finally, "AM" will be verified by a high pitched BEEP.

Once the times have been set, and verified if necessary, depress "S" to Start the clock. If you are not using a display, the "tick-tock" sound will let you know the clock is running. If the "ticking" sound is too loud, change the number 15 in Line 212 to a lower number. "0" will completely cancel the sound.

To stop an alarm which is already sounding, depress the SPACE BAR. The alarm will sound again in 24 hours. The alarm will automatically stop after one minute. To

TURN OFF the alarms, depress the letter "C" (cancel alarms). The alarm times remain in memory, and depressing the letter "A" (Alarm) will turn the alarms ON again. The alarms can be turned on and off only while the clock is operating.

ACCURACY CORRECTION FACTOR

Look at Line 3 of the listing. CF is the "correction factor", and it must be changed to equal the number of seconds gained or lost during a 24 hour period. A negative number will slow down the clock, and a positive number will speed it up. Example: After a day (24 hours) "ALARM CLOCK" gained 2 minutes and 57 seconds. This is equal to 177 seconds. Now change Line 3 to "LET CF=-177". If "ALARM CLOCK" is still not accurate within one second per day, determine how many seconds fast or slow it is running. Subtract this number from the previously calculated value of CF to slow down the clock, or add it to speed it up. Example: Having changed Line 3 to "LET CF=-177", your alarm clock was running slow at a rate of 2 seconds per day. Add 2 to -177, so now, "LET CF=-175. Note: The ON ERR command in Line 5 will prevent you from "breaking" into this program. To change the value of CF, you can MERGE the program, and then make the necessary changes.

Hope you enjoy this program, and look for an interesting graphics program that is scheduled to appear in an upcoming issue of TDM.

```
1 REM      ALARMCLOCK BY
          KENNETH FRACCHIA
3 LET CF=0: REM  CF IS THE
CORRECTION FACTOR, AND IS EQUAL
TO THE NUMBER OF SECONDS GAINED
OR LOST DURING A 24 HOUR PERIOD.
A NEGATIVE NUMBER WILL SLOW DOWN
THE CLOCK. A POSITIVE NUMBER
WILL SPEED IT UP.
4 BORDER 0: INK 7: PAPER 0: L
ET CF=CF/1440: CLS : DIM T$(6)
5 ON ERR GO TO 1
6 PRINT AT 12,0;"T,A,B-SET ST
ART";TAB 21;"A-TURN ON";TAB 0;"A
ND ALARM TIMES";TAB 21;"BOTH ALA
RMS"
7 PRINT AT 15,0;"UT,VA(VB-VER
IFY";TAB 21;"C-CANCELS";TAB 0;"A
BOVE TIMES";TAB 21;"(TURNS OFF)"
;TAB 21;"BOTH ALARMS"
8 PRINT AT 18,0;"S-START CLOC
K";TAB 3;"NOW USE";TAB 3;"COM
MANDS";TAB 3;"AT RIGHT"
9 PRINT AT 10,0;"CAPS-SHIFT &
BREAK TO RUN AGAIN"
10 POKE 23658,8: LET B$="Y": L
ET H=0: LET M=0: LET S=0: LET AH
=0: LET AM=0: LET BH=0: LET BM=0
: LET Y=0: LET Z=0: LET W=0: LET
M$="": LET N$="": LET O$="": DI
M T$(6): FOR X=1 TO 5: BEEP .2,2
: NEXT X
15 IF INKEY$<>"" THEN GO TO 15
17 IF INKEY$="" THEN GO TO 17
18 IF INKEY$="S" THEN GO TO 20
7 19 IF INKEY$="B" THEN LET W=1:
GO TO 35
20 IF INKEY$="T" THEN LET Z=1:
GO TO 35
25 IF INKEY$="A" THEN LET Y=1:
GO TO 35
26 IF INKEY$="U" THEN BEEP .1,
5: GO TO 300
30 GO TO 15
35 BEEP .1,5
36 FOR X=1 TO 6
40 IF INKEY$<>"" THEN GO TO 40
```

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ALARM CLOCK

```

42 IF INKEY$="" THEN GO TO 42
45 LET I$=INKEY$: BEEP .1,5
50 LET T$(X)=I$
55 IF I$="M" THEN GO TO 65
60 NEXT X
65 IF T$(5)="M" THEN LET T$(2
TO 6)=T$(1 TO 5): LET T$(1)=""
66 IF T$(5 TO 6)<>"AM" AND T$(5
TO 6)<>"PM" THEN BEEP 1,-20: G
O TO 15
67 IF T$(1)<>" " AND T$(1)<>"1
" THEN BEEP 1,-20: GO TO 15
68 IF T$(2)<>"0" OR T$(2)>"9" O
R T$(3)<>"0" OR T$(3)>"5" OR T$(4
)<>"0" OR T$(4)>"9" THEN BEEP 1,-
20: GO TO 15
69 IF T$(1)="1" AND T$(2)>"2"
THEN BEEP 1,-20: GO TO 15
70 IF Z=1 THEN LET H=VAL T$(1
TO 2): LET M=VAL T$(3 TO 4): LET
M$=T$(5 TO 6): PRINT AT 4,11;"S
TART TIME "AT 6,12;T$(1 TO 2);"
";T$(3 TO 4);";";T$(5 TO 6): L
ET Z=0: GO TO 15
75 IF Y=1 THEN LET AH=VAL T$(1
TO 2): LET AM=VAL T$(3 TO 4): L
ET N$=T$(5 TO 6): PRINT AT 0,5;"A
LARM-A"AT 2,21;T$(1 TO 2);";";T
$(3 TO 4);";";T$(5 TO 6): LET
Y=0: GO TO 15
80 IF W=1 THEN LET BH=VAL T$(1
TO 2): LET BM=VAL T$(3 TO 4): L
ET O$=T$(5 TO 6): PRINT AT 0,21;"A
LARM-B"AT 2,21;T$(1 TO 2);";";T
$(3 TO 4);";";T$(5 TO 6): LET
W=0: GO TO 15
207 LET S1=PEEK 23672+60-CF: IF
S1>=256 THEN LET S1=S1-256
208 PRINT AT 4,11;"H M S "
210 PRINT AT 6,12;"(" " AND H<10
)+STR$ H;TAB 15;" :TAB 16;(" "
AND M<10)+STR$ M;TAB 19;" :TAB
20;("0" AND S<10)+STR$ S;TAB 23;
M$:
211 SOUND 8,0;9,0;10,0
212 SOUND 7,31;10,15;10,0
213 IF S=0 THEN LET A$="A"
214 IF ((H=BH AND M=BM AND M$=N
$) OR (H=BH AND M=BM AND M$=O$))
AND A$="A" AND B$="Y" THEN GO T
O 400
216 IF INKEY$="A" THEN LET B$="Y":
SOUND 7,56;1,1;3,1;5,1;8,15;
9,15;10,15: PRINT AT 1,7;"
217 IF INKEY$="C" THEN LET B$="N":
SOUND 7,56;1,3;3,3;5,3;8,15;
9,15;10,15: PRINT FLASH 1;AT 1,7
;"OFF";AT 1,23;"OFF"
218 LET P=PEEK 23672
220 IF ABS (S1-P)>3 THEN GO TO
218
227 LET S1=S1+60-CF: IF S1>=256
THEN LET S1=S1-256
229 LET S=S+1
230 IF S=60 THEN LET m=m+1: LET
s=0
235 IF m=60 THEN LET h=h+1: LET
m=0
240 IF h=13 THEN LET h=1
245 IF M$="PM" AND H=12 AND M=0
AND S=0 THEN LET M$="AM": GO TO
209
247 IF M$="AM" AND H=12 AND M=0
AND S=0 THEN LET M$="PM"
250 GO TO 210
300 IF INKEY$<>"" THEN GO TO 30
302 IF INKEY$="" THEN GO TO 302
303 IF INKEY$="T" THEN LET F=H:
LET G=M: LET E$=M$: GO TO 307
304 IF INKEY$="A" THEN LET F=AH
: LET G=AM: LET E$=N$: GO TO 307
305 IF INKEY$="B" THEN LET F=BH
: LET G=BM: LET E$=O$: GO TO 307
306 GO TO 300
307 BEEP .1,5: FOR X=1 TO 200:
NEXT X
308 FOR X=1 TO F: BEEP .7,5: NE
XT X: FOR X=1 TO 80: NEXT X
309 LET IN=INT (G/10)
310 FOR Q=1 TO IN: FOR R=1 TO 1
0: BEEP .03,5: NEXT R: FOR X=1 T
O 15: NEXT X: NEXT Q
312 FOR X=1 TO 80: NEXT X: FOR
X=1 TO G-10*IN: BEEP .7,5: NEXT
X: FOR X=1 TO 80: NEXT X
313 IF E$="AM" OR E$="PM" THEN
BEEP 1.5,(25 AND E$="AM")-(15 AN
D E$="PM")
314 GO TO 15
400 SOUND 7,56;1,1;3,1;5,1;8,15;
9,15;10,15
402 IF INKEY$="" THEN GO TO 215
406 IF INKEY$="" THEN LET A$="C"
410 GO TO 215
9999 SAVE "ALARMCLOCK" LINE 1

```

Dear M S C R I P T e r s ,

August 13, 1987

The official "Fairware" newsletter.

Jack Dohany

I had hoped to have the next version of Customized MSCRIPT done by now. It was to have been called V5.3. But that changed last night.

I stayed up all night working on V5.3, in a creative binge. New ideas and solutions were flowing like water over Niagara. In dawn's early light I realized that what I have here is Version 6...a really radical change from V5. Oh, it's not done yet...there are loose ends to tie up, compaction to be done, testing, docs to be written...but essentially all of the new features that I will describe are WORKING.

When will it be ACTUALLY done? Well, if I had nothing else to do but work on this program, it would be done in 3 days. But I earn my living by making wooden toys and selling them at craft fairs...and the fair season is just starting. So I estimate 2 or 3 weeks til V6 is totally done. Maybe more...

I regret any inconvenience this may cause. I can only assure you that V6 is worth waiting for. When done, it'll be sent out on a "first come, first served" basis. I only have time to send out a few copies a day.

IMPORTANT NOTE: Before I can send you V6, I need a copy of your printer manual!!! NOT the whole thing, but just a few pages (usually in the back of the manual) that list all of its control codes. Do not tell me that your printer is "Epson-compatible". For my purposes, there is no such thing.

If you have more than one printer, send manual-copy for each. Even if you have a daisywheel, I still want the manual-copy.

V6 is designed to use fully the power built into modern dot-matrix printers; but some of the new features will also be quite useful for daisywheels.

I have several general requirements for V6:

1. It must have no less text room than V5.
2. It must be compatible with V5 where possible.
3. It must be extremely easy to use and understand.
4. The documentation must be clear, concise and thorough.

5. It will be "pre-customized" for the user's printer, so that the user can immediately use it without having to figure out how to customize it. That's why I need your manual-copy.

First some definitions:

TRANSIENT: definable by user within textfile.

SEMI-PERMANENT: predefined by me, but re-definable by user from BASIC or by using another program such as FONTMAN.

PERMANENT: not user-definable.

LIST OF NEW FEATURES IN V6

1. PRINT-PAUSE/QUIT

During printing, press ENTER to pause printing, press ENTER again to resume. Or press SYMBOL-SHIFT+BREAK to terminate printing.

2. DUAL FONTS: there will be two SEMI-PERMANENT 96-character fonts: a MAIN font and a GRAPHICS font.

3. There will be a GRAPHICS cursor, selectable by FUNCTION-9. When the graphics cursor is used, graphics characters will go into your textfile, and will be represented on-screen by the graphics font. How your printer prints these characters will depend on the capabilities of your particular printer.

If your printer has 1 or more bit-image modes, these will be user-selectable within text; and both the MAIN font and GRAPHICS font will be used for printing if you have selected one of the available bit-image modes. These modes essentially govern how many characters will fit on a line.

4. Transient ITALICS control. (PCODE *)



5. New IMBEDDED CODE SYSTEM: There will be 3 kinds of imbedded codes:

1. NCODES 0-9; transient; short for NUMERIC CODES.
2. LCODES a-z; A-Z; semi-permanent; short for LETTER CODES
3. PCODES permanent; short for PUNCTUATION CODES.

NCODES are the normal MSCRIPT printcodes #0-#9.

LCODES are new; each LCODE is a single letter that represents a sequence of printer control codes. Tasword has 16 similar gadgets. We will have 52, and they will be quite discernible on screen.

PCODES are like normal MSCRIPT imbedded "+" and "--" symbols. They are used to control things such as ITALICS on/off, and GRAPHICS PRINTMODE on/off, and BIT IMAGE MODE selection.

All of the above codes are imbedded in the usual MSCRIPT manner, using FUNCTION-G.

6. The Mscript FIND function will be made less fussy.
7. A few minor MSCRIPT flaws may be corrected.
8. MSCRIPT BASIC will be drastically simplified.

Some of this may sound complex. But believe me, V6 will handle like a 1987 Ferrari, instead of the 1947 Buick resembled by V5. NOTE: if you do not have a good font generator program, then I suggest you order my new FONTMAN. It's very full-featured and includes 20 editable fonts and a fast MC font editor that is controlled by the keyboard or either joystick.

How much is all this gonna cost you? Well, as usual that's up to you; I'd suggest \$15 for V6, \$5 for FONTMAN, +\$5 for media/mail/handling/documentation. Donate AFTER you get and try, please.

If you have only a 2040 or daisywheel, or are not interested in graphics, you may prefer just to have V5.2. If so, holler.

In any case, please be sure I know what printer interface(s) and mass storage device(s) you have.

Other new FAIRWARE goodies now available:

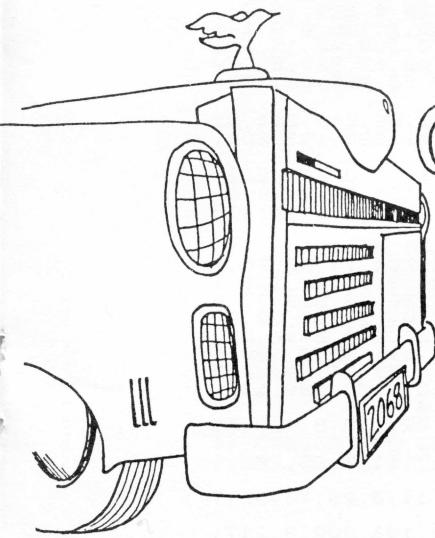
1. Customized VUCALC for big printers.
2. Customized MASTERFILE for Aerco disc + big printer. (comes with a Sinclair Vendor database)
3. Duane Ruck's BA64 for AERCO disc, now with full printer support by Jack Dohany; with special version of FONTMAN.
4. PRX...an experimental printer driver, the "seed" for SUPERDRIVER.

FAIRWARE GOODIES in the works: (NOT available real soon)

1. SUPERDRIVER: maximum printer support package
2. BIGFONT: for making and using big, complex fonts.

Please note that MSCRIPT, VUCALC, and MASTERFILE are copyrighted. You must certify that you are a legal owner of each before I can send you my customized version.

I thank all of you for your continued patience and support...and a BIG thank-you to TIME DESIGNS for printing this.



Welcome to another installment of CLASSY FRONT END. And "thank you!" to all who have written and who have sent in sample listings, tapes and comments on past CFE articles. It is certainly a thrill to see how much interest this segment has spawned. It makes all those late nights worth it! Speaking of which: I mistakenly said in the last article that my new son was sleeping through the night...seems now I'm spending more time at the crib than at the keyboard!

Listing 1 is a complete BASIC listing for the first 283 bytes of the total CFE machine code program, plus 23 bytes of code and necessary BASIC lines to allow testing and running of this portion. Listing 2 is a disassembly of the 283 + 23 bytes of code which for this example resides at address AFC8 (45000 decimal). Please note that the 23 bytes contained in lines 100 and 110 in Listing 1 and those 23 bytes starting at address BOE3 (45283 decimal) in Listing 2 will be dropped when we put the total program together next issue.

For those who saw it, remember the movie "2001", and how puzzled you were when you walked out? Think of next issue as "2010".

Listing 1 very simply reads the print coordinates from BASIC lines and converts them to PLOT coordinates. "Is that all?", you might ask. Well, almost. There are also some error traps and a facility to read values from eight variables we can set up. Now I'll admit I don't have the machine language prowess some readers undoubtedly possess. But the program does function well. If anyone has some ideas for shortening or enhancing the code, by all means send it to me! In this program, DE is set equal to the values we POKE into the spare RAM addresses at 5C00 and 5C01 (23728 and 23729 decimal). These values tell the program where it is in memory. (By using relative jumps CFE can reside in any free area of memory.) HL acts as the BASIC pointer and BC and A are used for computation. CFE saves and restores all registers, so should not interfere with other code you may wish to run with it.

We can't possibly discuss all the code here, but I will shed some light on the things you need to know. Looking at Figure A you will see a list by address of lines 230 and 240 of Listing 1. The USR call starts the code to reading the contents of the next line which must always be a REM statement. If the program doesn't find " (quotation), AT, or TAB, then the program will halt with "ERROR A" (plus the offending CHR\$) printed at the bottom of the screen. You can then escape by hitting BREAK. If no error is found, the program will read the coordinates. In this example, both are variables (a and b). As shown in Figure B, the first thirteen bytes of code are storage. The first three are flags, the next eight are variables (a through h) and the last two are the PLOT coordinates x and y. In this example, the program finds the values 21 and 31 in a and b, and converts them to PLOT coordinates, which are 248 and 31.

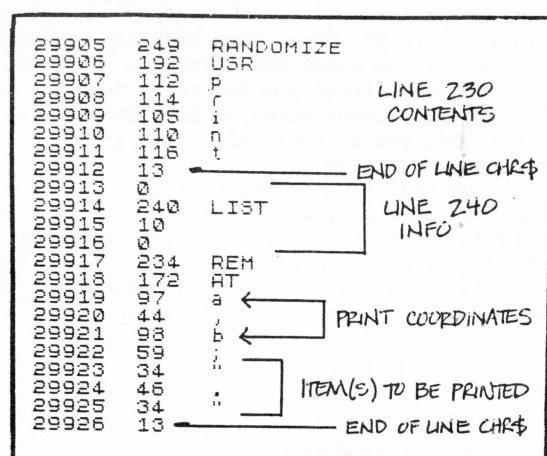


Figure A

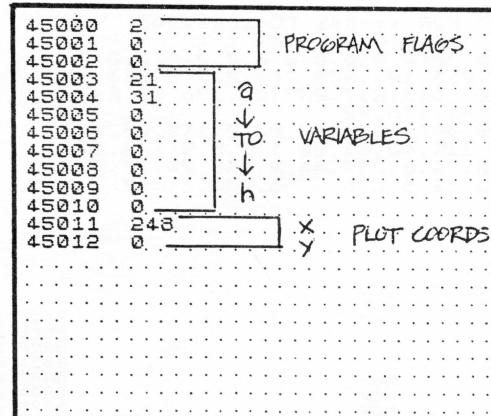


Figure B

This may all sound pretty simple, but it isn't. The program handles variables, single digits and double digits in any configuration and converts them. If the program runs across improper syntax here it will halt with "ERROR B" plus the offending CHR\$ as before. With TAB the value read and converted is the x value, the y value remains whatever it was previously (as in BASIC). A BASIC line like REM ". ." will print at the location x and y were set to previously. For PLOTting to a location on the screen which is different than the 0 to 21 by 0 to 31 PRINT coordinates conform to, we can POKE PLOT values in the x and y slots directly then execute a REM "whatever" to print "whatever" starting exactly where we want it.

Now let me just detail a couple of nifty little routines this program uses that can be incorporated in any program. In line 100 of Listing 1 is the code which accesses the PLOT routine in the TS2068 ROM. By letting BC hold the coordinates we want and then calling 2638 (9784 decimal), the TS2068 will PLOT our point. Coordinates too big for the screen will return with an error message as in BASIC.

Another likeable routine is a B041 in Listing 2. By calling 2009 (8201 decimal) we access the TS2068's routine to read the keyboard for BREAK. A simple six byte program will access it: CD0920,38FB,C9 (205, 9, 32,56,251,201 in decimal) will do it!

Continued Next Page.

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Now Listing 1 run as-is will produce a grid of dots on the screen corresponding to the PRINT coordinates available (see Figure B). These dots indicate the bottom left-hand corner of the first CFE letter to be printed. By testing other BASIC lines you can get a feel for what the program needs as coordinates. As in BASIC, the error traps will not tell you if your values are too big, but covers most syntax problems.

Next time we will look at the business end of CFE: the printing routines! If you just can't wait until next time, I would be happy to send you an advanced copy of the disassembled listing. Just send (\$1) to : Paul Bingham, P.O. Box 2034, Mesa, AZ 85214. For the full program on tape send \$5. See you next time!

Listing 1

```

1 REM      cfe.3
4 LET code=45000
5 LET Print=code+13
6 POKE 23728,(code-256*INT (c
ode/256)) : POKE 23729,INT (code/
256)
7 FOR t=code TO code+305: REA
D o: POKE t,o: NEXT t
10 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,213,197,229,245,217,8,213,19
7,229,245,217,237,91,176,92,217,
237,91,176,92
20 DATA 98,107,62,0,119,35,119
,35,119,42,85,92,1,5,0,9,126,254
,173,32,6,235,54,2,235,24,77,254
,172,32,6,235,54,1,235,24,67
90 DATA 58,118,92,1,8,8,103,62
,0,203,68,40,1,129,203,33,203,44
,16,245,213,235,17,11,0,25,209,1
19,225
100 DATA 229,33,11,0,25,78,35,7
0,205,55,38,225
110 DATA 241,225,193,209,8,217,
241,225,193,209,201
200 FOR y=0 TO 21
210 FOR x=0 TO 31
220 POKE code+3,y: POKE code+4,
x
230 RANDOMIZE USR Print
240 REM AT a,b;"."
250 NEXT x
260 NEXT y
300 STOP
500 FOR t=code TO code+12: PRIN
T t;" ";PEEK t: NEXT t

```

Listing 2

B02C 3E52
 B02E D7
 B02F 3E52
 B031 D7
 B032 3E4F
 B034 D7
 B035 3E52
 B037 D7
 B038 3E20
 B03A D7
 B03B 3E78
 B03C D7
 B03E 3E78
 B040 D7
 B041 C00920
 B044 38FB
 B046 F1
 B047 E1
 B048 C1
 B049 C1
 B04A 08
 B04B D9
 B04C F1
 B04D E1
 B04E C1
 B04F C1
 B050 C9
 B051 23
 B052 7E
 B053 016108
 B055 D5
 B057 E5
 B058 210300
 B059 19
 B05C E8
 B05D E1
 B05E B9
 B05F 2003
 B051 1A
 B052 1832
 B054 0C
 B055 13
 B056 10F6
 B057 D1
 B059 01300A
 B061 1A
 B062 1832
 B064 0C
 B065 13
 B066 10F6
 B067 D1
 B069 0A30
 B070 0B08
 B071 0C
 B072 10FA
 B073 1642
 B074 10A4
 B075 D5
 B076 0B04
 B077 0C
 B078 0B08
 B079 4F
 B07A 23
 B07C 1A
 B07D FE01
 B07F 2004
 B081 1E3B
 B083 1802
 B085 1E2C
 B087 7E
 B088 BB
 B089 79
 B08A 200B
 B08C 0B09
 B08E 0A
 B08F 10FD
 B091 4F
 B092 3ED0
 B094 06
 LD A,52
 RST 10H
 LD A,52
 RST 10H
 LD A,4F
 RST 10H
 LD A,52
 RST 10H
 LD A,20
 RST 10H
 LD A,78
 RST 10H
 LD A,78
 RST 10H
 CALL 2009
 JR C, B041
 POP AF
 POP HL
 POP BC
 POP DE
 EX AF, AF
 EXX
 POP AF
 POP HL
 POP BC
 POP DE
 RET
 INC HL
 LD A, (HL)
 LD BC, 0B61
 PUSH DE
 PUSH HL
 ADD HL, DE
 EX DE, HL
 POP HL
 CP C
 JR NZ, B054
 LD A, (DE)
 JR B096
 INC C
 INC DE
 DJNZ, B05E
 POP DE
 LD BC, 0A30
 CP C
 JR Z, B077
 INC C
 DJNZ, B06C
 EX DE, HL
 LD D, 42
 JR B01B
 PUSH DE
 ADD A, D0
 LD C, A
 INC HL
 LD A, (DE)
 CP 01
 JR Z, B085
 LD E, 3B
 JR B087
 LD E, 2C
 LD A, (HL)
 CP E, C
 JR Z, B097
 LD B, 09
 ADD A, C
 DJNZ, B08E
 LD C, A
 LD A, D0
 ADD A, (HL)
 B095 81
 B096 83
 B097 D1
 B098 02
 B099 03
 B09C 0E
 B09E 1A
 B09F FE02
 B0A1 2823
 B0A3 0108A8
 B0A6 3A765C
 B0A9 6F
 B0AA 3E00
 B0AC BD
 B0AD 2808
 JR Z, B0B7
 INC A
 PUSH AF
 LD A, B
 SUB C
 LD B, A
 POP AF
 JR B0AC
 LD A, B
 PUSH DE
 EX DE, HL
 ADD HL, DE
 POP DE
 LD (HL), A
 LD A, 02
 LD (DE), A
 POP HL
 JR B052
 LD A, (SEED)
 LD BC, 0B60
 LD H, A
 LD A, 00
 BIT 0, H
 JR Z, B096
 ADD A, C
 SLA C
 SRA H
 DJNZ, B0CF
 PUSH DE
 EX DE, HL
 LD DE, HL
 ADD HL, DE
 POP DE
 LD (HL), A
 POP HL
 PUSH HL
 LD HL, 000B
 LD DE, HL
 ADD HL, DE
 POP DE
 LD (HL), A
 POP HL
 PUSH HL
 LD HL, 000B
 ADD HL, DE
 LD C, (HL)
 INC HL
 LD B, (HL)
 CALL 2638
 POP HL
 POP AF
 POP BC
 POP DE
 EX AF, AF
 POP AF
 POP HL
 POP BC
 POP DE
 RET

TS Communique

Joe Williamson

A forum for people having problems with their 1000, 1500 and 2068. If you have any questions, send it to:

TS Communique
c/o Time Designs Magazine Co.
29722 Hult Road
Colton, OR 97017

I have a Sony video camera, Model 8AF. Now Sony's new model V110 has a built-in character generator for adding titles to the tape recording. Unfortunately, I was premature in my purchase, not knowing of the forthcoming new model. I thought I might use my 2068 as a character generator feeding the video output into my camera after programming the computer to display the title.

The idea was fruitful and I was successful in taping titles.....but in black and white only! I use channel 3 and the display on my monitor or a TV is in brilliant color. I tried the color adjustment you suggested to John Buckmaster in the MAR/APR issue of TDM but with no success. There are no adjustments available on the camera. Of course I could point my lens at the screen but the tittles are not clean and sharp.

William Andrews
San Anselmo, CA

Dear William,

You may want to try connecting the 2068 to the CCD-V8AF video in and monitor the video coming from the camera and then adjust the color as told in the Mar/Apr issue. If this does not work then it must be that the signal from the 2068 is not compatible enough to work. -Joe

I am looking for information concerning a routine or program to use an Atari CX85 Hex Keyboard for entering numerals on a Timex 2068. I purchased an Atari joystick and using the programs in TD, I had no trouble. Since the Hex keyboard used the same port as the joystick, I thought just plugging it in would work. It would not. Therefore, any suggestions or ideas from you or your readers of TD would be greatly appreciated. The keyboard uses the National Semi. 74C923 (what ever that is??).

Glenn Ruch
Lehighton, PA

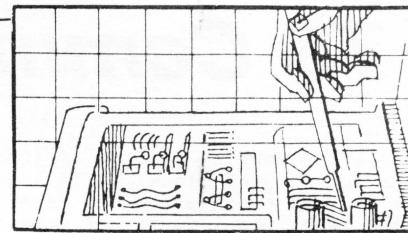
Dear Glenn,

The 74C923 is a 20-key keyboard encoder. A few years back there was a company that sold that keyboard with instructions on how to modify joystick port 2 on the 2068 by adding and/or cutting out diodes to allow the hex pad to work. I checked through my collection of newsletters and flyers and could not find it. If anyone has one or the information, please pass it on. -Joe

I have two questions for the TS Communique column. 1: I have 3 2068s and one of them has a very jerky screen for about 10 minutes when it is first turned on or if I attach any peripherals to it it jerks all of the time. The screen seems to fan out at the bottom every time you hit enter or do a screen DRAW.

2: I am trying to write a program that stores data in a long string. I didn't want to dimension a string so that the program would grow as data was added but when the string gets about 8200 characters long and I try to add more to it, i.e. LET A\$=A\$+N\$, the computer thinks it is out of memory and stops with an error report even though I have 22000+ bytes left. Is there a way around this without dimensioning a long string and if not how can I add length to a dimensioned variable without loosing the data in it.

Larry Zunk
Norman, OK



Dear Larry,

Your problem 2068 sounds like it may have a power supply problem. Check the 12 volt supply at U8 (the 12 volt regulator) or at C44 (first electrolytic capacitor behind speaker) for a steady 12 volts even when peripherals are added. Also check the 5 volt line on the positive end of C40 (largest capacitor in front of RF modulator). If these are OK, try a monitor with the computer. If that works OK, suspect the RF modulator. If monitor does not work OK, suspect Q4 or Q5 and possibly the decoupling capacitors in the video circuit and last but not least, the SCLD.

For your second problem, I assume you don't want to dimension an array because of increased loading and saving time. So, why not do what Pro/Flle does and save A\$ as machine code. That way you could save just the program and then upon loading next time, have the program dimension whatever it needs and then load your data into the dimensioned area. To do this, A\$ (in your case) would have to be dimensioned first and always first. The beginning address of the variables (VARS) is held by locations 23627 & 23628. Because A\$ is first, you can peek these locations and find the starting address.

The actual data starts 6 bytes (the first six bytes contain the name of the array and the length) from the starting address. You will have to keep track of how long the data array is so you can save just the data and know where the end is, call the length L. So to save the data, use: SAVE "name" CODE 6+PEEK 23627+256*PEEK 23628, L and to load, use: DIM A\$(whatever length you want):LOAD "name" CODE 6+PEEK 23627+256*PEEK 23628. Keep track of the length L. You could even save it as part of your data. You can also load up you present data and convert it over to this new way of LOAD/SAVEing. -Joe

I have two plain Timex 2068's and from the copyright screen at initial turn on, I ask "PRINT FREE".

#1 2068 answers 38652
#2 2068 answers 6012

I discovered this problem when I tried to LOAD a long program from tape and got the "4 Out of memory" error. Any ideas on what the problem is and how it can be fixed?

Dennis Zacharias
Yukon, OK

Dear Dennis,

If you take 38652 and subtract 6012 you get roughly 32K of memory missing. This would indicate that the upper 32K of memory is either bad or not being refreshed (updated) by the SCLD. There are three banks of 16K RAM inside the 2068. Obviously the lowest (16-32K) bank is working because it initializes and displays a picture (the display file and system variables are in the 16-32K region).

Most likely the SCLD IC is not properly refreshing the upper 32-64K region. It is possible that the memory ICs themselves are bad. To check this try writing a program that successively POKEs each address between 32768 and 65535 with 0 the reads it back and then POKE the same address with 255 and read it back and have it print each address which gives back the wrong answer. If none of them do, then the SCLD is bad. If some do, see if it is in a specific bank such as the 32-48K bank or the 48-64K bank. U12 & U13 is the 32-48K bank and U17 & U18 are the 48-64K bank. -Joe

Continued Next Page.

TS Communique

After working with my TS 1000 for 30 minutes or so, the screen goes blank. It is located on a hard surface to prevent overheating. It doesn't feel very warm to my hand. What can I do to get more time on the computer

Robert Haver
Atlanta, GA

Dear Robert,

The first thing to do is to see where the problem is coming from. If you have a 16K RAM pack, remove it and see if it still goes blank after 30 minutes or so. If it does, it is probably the ULA chip inside the computer although I have seen a weak 5 volt regulator do the same thing. Get some freeze mist from Radio Shack and try pinpointing the problem after it goes out by freezing an IC chip and then unpower/repower it. Once you have determined what the problem is, some TS 1000 vendors may have spare parts or computers but good luck.

If you suspect the RAM pack as having the problem, first check the the voltages on the RAM IC chips inside. Pin 1 should have -5 volts on it, pin 8 should have around +12 volts on it and pin 9 should have +5 volts. The negative supply would most likely be the problem, particularly the switching transistor connected to the small transformer. If its not the power supply, it is most likely one of the memory chips. If this is the case, it would be easiest to just replace the entire RAM pack. Good luck. -Joe

Winter Fest '88

The Timex/Sinclair user groups of Florida announce that the Sun State Timex/Sinclair Winter Fest '88 will be a reality next March 4, 5, and 6 1988 in Orlando at the Orlando Marriott on International Dr. Everyone should plan to come, bring the family and spend the week here in the #1 vacation spot in the US! Our third organizational meeting will be held the last of September. Full details will be in the next issue of Time Designs. For more information now, call the Sunstate TS bulletin Service at (904) 775-0093, 300 baud 8-1-N, 24 hours, 7 days a week. Or write to: 249 N. Harden Ave. Orange City, FL 32763. -Joe Williamson

MAX 1000

Make the Most Popular "Mods" Compatible On Your TS1000

Tim Stoddard

How would you like to have a TS1000/ZX81/TS1500 that loads and saves any size program from a diskette drive within 3 seconds, has a built-in DOS, has 64K of memory, runs programs that display up to 80 columns of text (upper and lower case), can communicate with BBS's easily, and down/upload a full 16K file via ASCII xfer or XMODEM without hassles, run machine code anywhere up to location 49152?

This article is about the integration of Larry Kenny's LARKEN INTERFACE, a TS/ZX with the internal 64K mod or external 64K & HUNTER board, a 2050 modem, Fred Nachbaur's ZX-TERM*80 from Silicon Mountain Computers, and John Olinger's M1 NOT adapter.

I had a lot of fun with this combination because ZX-TERM*80's hi-res display routine occupies the same area that LARKEN's LDOS does. Fred's EXCELLENT manual on ZX-TERM*80 hinted on a solution to this problem: How do we use this SUPER communications program with the SUPER disk interface from Larry Kenny? These are the notes on how I approached Fred's hint to the solution.....

ABOVE RAMTOP

ZX-TERM*80 is fully relocatable! However, it can't be placed in the "hidden" 8K area because that area is where the hi-res display file is located. It could be placed in the BASIC area, but then we take away the potentially large section of RAM to xfer files to and from. The manual indeed, shows how to set it up inside the BASIC area, but also describes how to relocate the program even above RAMTOP! This is great, but machine code routines above the 32K boundary are not executable....so how can this method work? I learned from Fred Nachbaur that John Olinger had developed a circuit that will allow the TS1000 or ZX81 to run machine code in the 32K to 48K area! The TS1500 has ALWAYS been able to do this!! I had not noticed this effect, so I tried a small routine on my TS1500 starting at 32768 and it worked! Try this yourself... POKE a 201 (RET instruction) at location 32768, then execute a RAND USR 32768. You'll get the 0/0 code back indicating completion. NOW try the same on an expanded TS1000 or ZX81. The code will store there, but when you execute the RAND USR 32768 the machine will reset! The M1 signal causes

CLIP ALL LEADS EXCEPT PINS
9&10 ON 74LS10

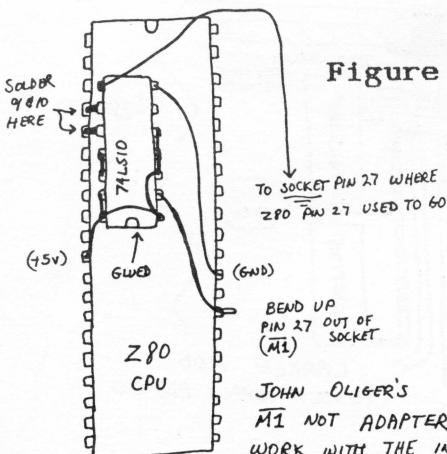


Figure 1

any RAM above 32767 to LOOK like RAM in the lower half of the memory map. This is done because of the unusual display routines for these machines. The TS1500 does the same thing but only in the 48K to 64K area. John Olinger's solution to this problem is to ALLOW the M1 signal only during the time it is needed: during the 48K to 64K area as in the TS1500. His circuit is normally installed on the ULA chip since that chip is the one that uses the M1 signal, which, by the way, indicates that the Z80 CPU is fetching an INSTRUCTION to EXECUTE. Some RAM upgrades do not use the M1 signal and these RAM packs will work, however some packs do use the M1 signal and will not work with this adapter and this is the case with my RAM upgrade. Don't despair, though! If the adapter is installed on the Z80 CPU so that the M1 signal is supplied EVERYWHERE, (instead of just the ULA chip), then it will work. FIGURE #1 diagrams the adapter installed on the Z80 CPU. Silicon Mountain Computer also sells the M1 NOT ADAPTER that installs on the ULA chip. This can be used by "tapping" off the M1 signal from the ULA chip and supplying it to the internal RAM decoding circuitry where the M1 signal normally goes. This is shown in FIGURE #2. After installing the adapter (either one) try again the test we used above. This time it will WORK! Now you can run ANY machine code residing in the 32K to 48K area.

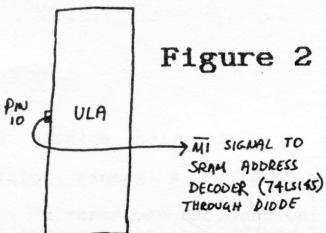


Figure 2

ADAPTING THE M1 NOT DECODER
FROM SILICON MOUNTAIN COMPUTERS TO
WORK WITH THE INTERNAL 64K MOD

Fred's Hint...

Since ZX-TERM*80 and LDOS use the same area of RAM we need a way of selecting only one at a time. Fred discusses this in the Addenda to the manual on page 2, "Mass Storage Considerations". In this discussion he describes using switches to disable/enable the Disk interface and the SRAM used for the 8K hidden area. FIGURE #3 shows the decoder for the internal 64K upgrade as shown in May/June 87 TDM. The wire from pin 2 to pin 3 of the 74LS145 is simply cut and is replaced with a switch mounted on the outside of the case. Switch OFF to disable the 8K area, and ON to enable the area. If you have a HUNTER board, replace the jumper at "J1" with a switch mounted at the top of the PCB, and add the resistor as shown in FIGURE #5. For those who are ambitious FIGURE #4 shows how to expand the decoding on my internal 64K upgrade to allow selection of the 8K area in 2K blocks AND allow for the needed enable/disable feature. I mounted the DIP switch shown in FIGURE #4 just behind the expansion edge connector

so that changes can be made through the expansion opening in the case. The enable/disable switch, of course, should be mounted somewhere on the outside of the case. Silicon Mountain Computer also sells an excellent 'updated' HUNTER board called the SCRAM board if you wish to go this route. Contact Fred Nachbaur there for pricing and modifying it for the enable/disable switch.

LARKEN INTERFACE

FIGURE #6 diagrams the interface and shows where to mount the enable/disable switch. Pin 1 of the 74LS139 must be bent out and a 4.7K resistor soldered from pin 16 to pin 1 of that IC. The two wires from the switch are then soldered to pin 1 of the 74LS139 and pin 6 of the 74LS32 just behind it. Again, switch 'ON' enables the interface and switch 'OFF' to disable it.

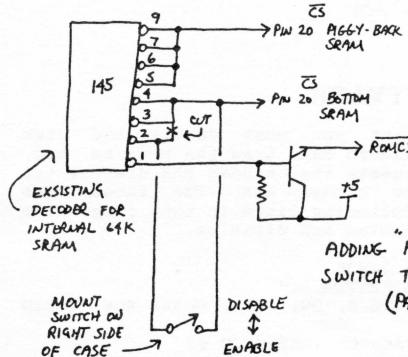


Figure 3

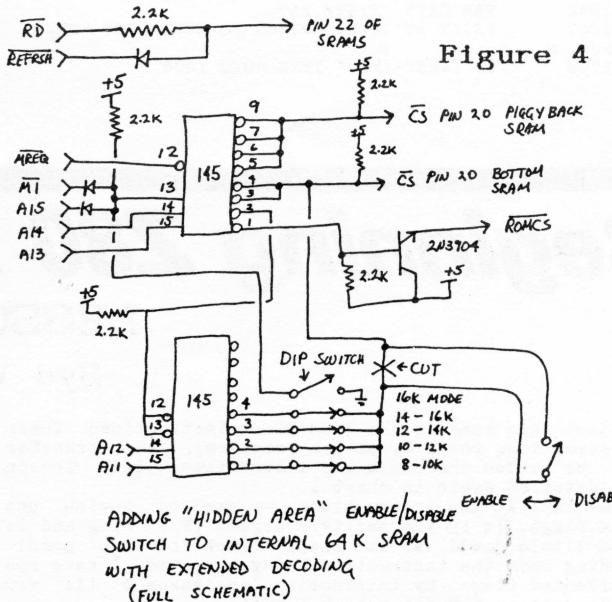


Figure 4

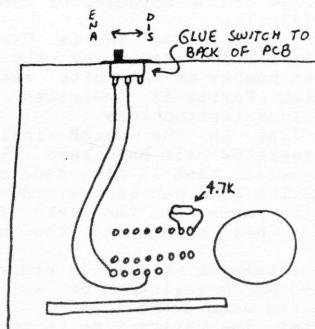


Figure 5

HUNTER BOARD MOD
FOR ADDITION OF ENABLE/DISABLE
SWITCH — BACK SIDE OF PCB

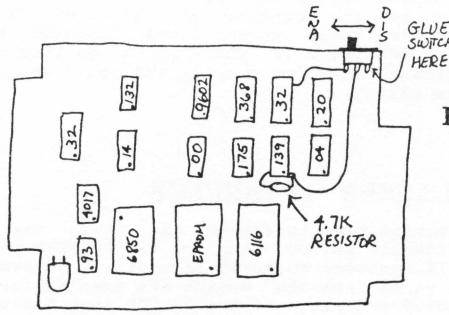


Figure 6

ZX81/T31000 LARKEN MOD
FOR ADDITION OF ENABLE/DISABLE
SWITCH - TOP SIDE OF PCB

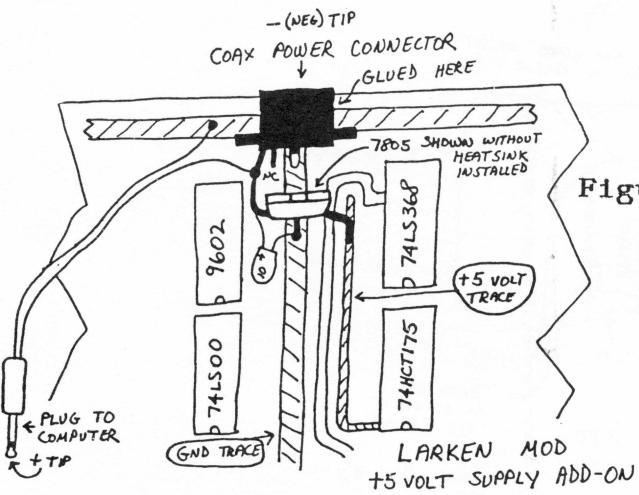


Figure 7

SOFTWARE

To use this arrangement you must enable the disk interface, and disable the hidden RAM. Load the program, and, just before the program accesses the hidden RAM disable the disk interface and enable the hidden RAM. For those with ZX-TERM**80 change/add the following lines in that program to prompt you for the needed enables and disables.

```

50      RAND USR 14336
55      REM SAVE "ZTERM.BC"
56      PRINT AT 10,0;"SWITCH TO SCRAM NOW, PRESS
C TO CONTINUE....."
57      IF INKEY$<>"C" THEN GOTO 57

980     PRINT AT 10,0;"SSWITCH TO DISK NOW, PRESS
C TO CONTINUE....."
985     IF INKEY$<>C THEN GOTO 985
1000    RAND USR 14336
1002    REM SAVE "ZTERM.BA"
1007    PRINT AT 10,0;"SWITCH TO SCRAM NOW, PRESS
C TO CONTINUE....."
1008   IF INKEY$<>"C" THEN GOTO 1008

```

The LARKEN does not come with a 5 volt supply. FIGURE #7 shows how to install a 7805 regulator, a coax power connector, and a power cord going to the computer onto the LARKEN board itself. A 9 volt wall-type power supply, such as the one built by Commodore and being sold very cheaply at Radio Shack, (277-1026), can now be used to power the entire set-up, via the coax power connector on the LARKEN interface.

The center leg of the 7805 and the tip connector of the coax socket (Radio Shack 274-1565) are soldered to the very wide trace. The right leg of the 7805 is soldered to the wide trace to the right of the very wide trace. The left leg of the 7805 and the wire, attached to the tip of the plug that will go to the computer, is soldered to the side connector of the coax socket. The wire attached to the side connector of the plug going to the computer is soldered to the very wide trace. Also install the 10 μ F tantalum cap to the 7805 regulator, as shown in FIGURE #7. NOTE: Attach a heatsink on the 7805 after installing it!

ENJOY these mods and we'll see you next issue!

POWER IT ALL

LARKEN MOD

Beginning Z80 Machine Code

LESSON TEN

Syd Wyncoop

The subject this time is the Z-80 Block instructions. There are block instructions for I/O, search (compare), and transfer (assignment). We listed the block I/O instructions last lesson but they are detailed again in chart 1.

Before we look at the instructions, we need to review one of the Z-80's flags. It is the parity/overflow (P/V) flag and is an overworked little devil, as it keeps track of two conditions, depending upon the instruction being executed. I gave you a chart of affected flags, by instruction, in lesson 5 (if you need lesson 5, contact TDM for a back issue!).

Overflow is similar to carry except that it occurs only when there is a carry from bit 6 to bit 7, of the accumulator, in signed arithmetic. The effect of an overflow is to change the sign bit of the accumulator. Overflow can be detected by use of the carry flag, but it is more difficult.

The use of the P/V flag we are interested in is Parity. Parity is either even or odd and is simply a count of the set bits in a byte or register. An even number of set bits results in even parity and a set parity flag. Parity is indicated with the logical, rotate, I/O and all block instructions.

The actual use of the parity flag in the block instructions is to indicate when the BC register pair has been decremented to 0 (see below). You will recall that 16 bit decrements do not affect the zero flag. Since the Z-80 can indicate BC=0 in the P/V flag, it could have done the same in the zero flag, except that the zero flag already has a use in the block instructions (see below).

There is one last piece of information we need in order to use the block instructions; how and which registers do we need to set-up? All the register pairs are used as follows.

The BC pair is a 16 bit counter. The parity flag is set and the block instruction is terminated when BC=0. There is no 8 bit counter allowed, except for the I/O instructions, where B serves the purpose.

The DE pair is a DESTination pointer for block memory transfers.

The HL pair, as usual, is a memory pointer for all the block instructions.

All the block instructions decrement BC and either increment or decrement DE and HL, according to the type of instruction. The third letter of the mnemonic will be 'i' for increment or 'd' for decrement.

If the fourth letter of the mnemonic is an 'r', then the instruction is functionally the same as the 3 letter version, except that the instruction repeats until a counter has been decremented to 0.

Now for the instructions. I have listed the instruction (a few samples for each group) with its operation broken into 'equivalent' instructions, next to it. REMEMBER, the equivalent instructions are for clarification ONLY and are not executable!

The first set is the completion of our I/O instructions, from last lesson.

Ini	Indr
Ld (HL), (C)	Loop Ld (HL), (C)
Inc HL	Dec HL
Dec B	DJNZ Loop

Notice that the block instruction is the same as the In r,(C) instruction from last lesson. The difference is that r can only be (HL) and the B register is a counter, hence the above 'equivalent' instructions.

Note also, how the auto repeat works. Since the repeat is part of the instruction, no other operation can occur in the loop (except, of course, interrupts--but that's next lesson). The loop is not exited until B=0.

The block Out instructions are the same except that the byte pointed to by HL is moved Out port (C).
The block search instructions are a variation of our old friend Cp (compare), as follows:

Cpd	Cpir
Cp (HL)	Loop Cp (HL)
Ret Z	Ret Z
Dec HL	Inc HL
Dec BC	Dec BC
	Jr NZ,Loop

Note the additional exit point (Ret Z). These are called the block search instructions, as they will look at each byte and set one of two flags. The zero flag is set if A=(HL), (there is no Ret to anything) or the parity flag is set if BC=0. Since the Ret Z is for demonstration only, it is important to know that the operations on BC and HL will occur, even if a match has occurred. Therefore, you may need to adjust a pointer, after a match.

For example, assume the accumulator contains FFh, HL contains 4000h and BC=06h. This is the section of memory to search:

Address	Contents
4000h	00h
4001h	09h
4002h	F9h
4003h	FFh
4004h	C9h
4005h	E1h

The search will end with the match at address 4003h and the registers will contain:

A = FFh
HL = 4004h
BC = 01h

The zero flag will be set, to indicate a match, and the parity flag will not be set, as we did not reach zero in BC.

The last group of block instructions are for memory transfers (move one block of memory from here to there). They are essentially a variation on the assignment instructions (Ld) except that they work on two memory locations, instead of a register and a memory location.

The registers must be set-up in advance for these instructions to work properly, as follows:

BC = size of block to transfer
HL = first byte address of block to transfer
DE = first byte address of new location of block, after transfer (DEstination)

Once the registers are set-up, the instructions work like this:

Ldd	Ldir
Ld (DE),(HL)	Loop Ld (DE),(HL)
Dec DE	Inc DE
Dec HL	Inc HL
Dec BC	Dec BC
	Jr NZ,Loop

Note that we have only one exit to the loop, the case where BC=0.

The following routine should be placed in your 0 REM statement, to move your MC above Ramtop:

```
Move Ld HL,Base ;start address of your MC
Ld DE,Ramtop+1 ;destination address above
                 ;Ramtop, where your MC will run
Ld BC,Length ;length of your MC routine
Ldir ;move your MC above Ramtop
Ret ;back to Basic
```

One important point, any absolute addresses (Call nnnn, Jp nnnn, etc.) must be adjusted to indicate locations within the new block. The usual method is to assemble your MC to run at its correct location, then place it in the Rem statement for storage and SAVEing. This is the better method of saving and running MC from high memory on the TS1000, than the method I gave last lesson. See if you can make a small change in the above routine to move your MC from high memory to your 0 REM statement, using the Lddr instruction.

The last caveat to watch for with transfers is overwriting a portion of your MC, if the blocks overlap. When there is an overlap of blocks, the bytes can often only be moved in one direction or from one end of a block. For example, the routine above moves a block from start to end. It could just as easily been moved from end to start, using the Lddr instruction, if the pointers indicated the end of each block.

The astute reader will begin to see some possibilities in these instructions, as they are fast and very powerful. You could, for instance, write your own 'find and replace' routines, create 'instant' screen swaps or even animate a small section of the display (sprites). I'll leave you with your imagination and the following routine.

Our routine deviates from the instructions of this lesson. It is a renumbering routine for Basic programs and is given as

a demonstration of what is possible and give you some more technique. It will renumber any Basic program from a stated line (which must exist) to the program end.

Many of the routines can be used in other programs, such as the input routine. It uses some error checking in order to avoid any non-numeric input. It also gives the method of converting an Ascii string of digits to a binary number for use in calculations. It does however lack a backspace or delete. Can you see how to add it by reading one additional key press and adjusting the buffer pointer? Notice how the carry flag is used to indicate an error. Also, note that space must be left at the end of the routine for the input buffer. Do you want prompts anywhere on the screen? Run the Input routine with a PRINT USR address!

Note that this program is written in rather large modules, that fall through to the next one. It is extremely hard to debug a program written in this fashion, unless you are using routines that are known to be bug-free. Can you see the obvious places for break-points, in order to test for debug purposes?

Note how we reuse the string data for the Renumber prompt. But, enough of this. Here's the routine:

```
*****RENUMBER BASIC PROGRAM*****
```

```
;Basic system variables:
Prog Equ 5C53h
LastK Equ 5C08h
;
;ROM calls:
KeyScan Equ 02E1h ;TS1000 = 02BBh
LnkAddr Equ 16D6h ;TS1000 = 03D8h
DeCode Equ 07BDh ;TS1000 only
;
Org FC00h ;TS1000 = 7C00h
;
;Test for a Basic Program to renumber for the TS2068
Start LD HL,(Prog) ;no program line number has the
BIT 7,(HL) ;7th bit set in high byte of line
RET NZ ;number, but start of VARS does
;no program-return to Basic
;
;Test for a Basic Program to renumber for the TS1000
Start LD HL,407Dh ;start of Basic program area will
LD A,78h ;contain an ENTER (chr$ 118) if no
CP (HL) ;program as will be first character
RET Z ;of the display file
```

FOR THOSE OF YOU WHO MAY HAVE MISSED IT!

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```

;This is common code for the 1000 and 2068
;Get data for renumbering
G_From CALL PrRnum ;prompt for Renumber from line #
LD HL,FromLn
CALL Print
CALL Input ;go get line #
JR C,G_From ;bad input-do it again
LD HL,OldLine ;save input in this variable
LD (HL),E
INC HL
LD (HL),D

;Now, get the first new line number
G_New LD HL,NewLn ;prompt for Start with new line #
CALL Print
CALL Input ;go get line #
JR C,G_New ;bad input-do it again
LD HL,NewLine ;save input in this variable
LD (HL),E
INC HL
LD (HL),D

;And, finally the step for the new line numbers
G_Step CALL PrRnum ;prompt for Renumber in steps of
LD HL,Incr
CALL Print
CALL Input ;go get step in lines
JR C,G_Step ;bad input-do it again
LD HL,Step ;save input in this variable
LD (HL),E
INC HL
LD (HL),D

;Search for first line to renumber
Search LD HL,(OldLine) ;set-up HL for Rom routine that
CALL LineAddr ;returns the address of the line
;whose number is held in HL, in the
;HL register pair, or the line that
;follows it, if it does not exist.
;The start of the previous line is
;returned in DE. The zero flag is
;set if the line number was found.
JR Z,ReNumb ;found it-ok to continue
LD HL,NotFnd ;not found-give error msg
CALL Print
RET ;and return to Basic

;Begin renumbering
ReNumb LD DE,(NewLine) ;get the next new line #
LD (HL),D ;load it into the present
INC HL ;line # bytes
LD (HL),E
INC HL ;advance pointer
PUSH HL ;save it
LD HL,(Step) ;get step between line #'s
ADD HL,DE ;and adjust the next line #
LD (NewLine),HL ;put next line # back in variable
POP HL ;retrieve pointer
LD E,(HL) ;get line length into DE
INC HL
LD D,(HL)
INC HL ;adjust pointer to start of Basic
ADD HL,DE ;line (after line # and length)
ADD HL,DE ;add line length to pointer to
;adjust for start of next line

; BIT 7,(HL) ;test for valid line # or ;2068 only
;start of Basic variables ;2068 only
RET NZ ;return to Basic, if done ;2068 only

; LD A,76h ;test for valid line # or ;1000 only
;start of D-File ;1000 only
RET Z ;return to Basic, if done ;1000 only

; JR ReNumb ;go do next line

;Print routines
PrRnum LD HL,ReNum ;special entry to print the word
;ReNumb (this saves data space)
Print LD A,(HL) ;HL=pointer to step thru messages
CP FFh ;check for terminating byte and
RET Z ;exit routine if found
PUSH HL ;save pointer
RST 10h ;rom print routine
POP HL ;retrieve pointer
INC HL ;and adjust it
JR Print ;loop to print next character

;Input routine
Input LD HL,Buffer ;storage for input
LD (Pointr),HL ;reset buffer pointer-effectively
;clearing the buffer

;This is for the TS2068 only
ScanKy LD A,FFh ;clear last input character
LD (LastK),A
CALL KeyScan ;use rom routine to get key pressed
LD A,(LastK) ;get newly pressed key code

;This is for the TS1000 only
ScanKy CALL KeyScan ;use rom routine to get key pressed
INC L ;and check for heavy-handed human
JR NZ,ScanKy ;to lift finger
NewKey CALL KeyScan ;use rom routine to get key pressed
PUSH HL ;which is returned in HL but,
POP BC ;is needed in BC for DeCoding
INC L ;check and wait for a new key press
JR Z,NewKey ;rom routine to decode key press, HL
CALL DeCode ;will point to proper key in the rom
;key table
LD A,(HL) ;put keycode into A from table

;This is common code for the 1000 and 2068
; CP 0Dh ;accept ENTER (1000=76h)
;JR Z,EndInp ;and end input if so, else
;CP 30h ;check for and accept only (1000=1Ch)
;JR C,ScanKy ;the digits 0 to 9, else
;CP 3Ah ;(1000=26h)
;CCF

JR C,ScanKy ;continue scanning the keyboard
DigOK LD HL,(Pointr) ;input has been accepted-retrieve
LD (HL),A ;buffer pointer and store digit
INC HL ;adjust pointer for next digit
LD (Pointr),HL ;and save it
RST 10h ;echo accepted key press to screen
JR ScanKy ;continue input
EndInp LD HL,(Pointr) ;retrieve the buffer pointer
LD (HL),A ;store ENTER in buffer
RST 10h ;advance print position to next line
;on the screen

;we now have accepted, verified and
;ended our input but it needs to be
;converted from a string of Ascii
;characters to a single word Binary
;number.

Asc2Bi LD HL,Buffer ;get start of input buffer
LD A,(HL) ;and first character
CP 0Dh ;check for input of ENTER only(1000=76h)
JR Z,Error ;and goto error routine if found
SUB "0" ;good character-make it binary
PUSH HL ;save pointer
LD DE,0 ;set-up for first run through loop
LD B,0 ;set-up for later use in BC
Mult10 LD C,A ;save current digit
EX DE,HL ;retrieve 'last value' of converted
;binary number-note: it is 0 at first
;and place it into HL
ADD HL,HL ;double it
LD D,H ;store HL*2 in DE
LD E,L ;double again
ADD HL,HL ;and one last time
ADD HL,DE ;adding HL*2 means HL=HL*10
ADD HL,BC ;add the current digit
EX DE,HL ;temporarily store 'last value'
POP HL ;retrieve pointer
INC HL ;adjust it
LD A,(HL) ;get next digit
CP 0Dh ;check for terminating ENTER (1000=76h)
RET Z ;and exit if found
SUB "0" ;good character-make it binary
PUSH HL ;save pointer
JR Mult10 ;loop back to multiply by 10

;Error LD HL,InpErr ;load bad input msg and
CALL Print ;print it
SCF ;signal error occurred
RET ;return to main routine

;Program Messages
ReNum DEF8 0Dh ;1000=76h
DEFM "ReNumber"
DEF8 FFh
FromLn DEFM "from line #:" ;1000=76h
DEF8 FFh
NewLn DEF8 0Dh ;1000=76h
DEFM "Start with new line #:" ;1000=76h
DEF8 FFh
Incr DEF8 "in steps of:" ;1000=76h
DEF8 FFh
NotFnd DEF8 0Dh ;1000=76h
DEFM "Sorry, I cannot locate the line"
DEFM "to renumber from!"
DEF8 0Dh,FFh ;1000=76h,FFh
InpErr DEF8 0Dh ;1000=76h
DEF8 FFh ;1000=76h
DEFM "****Invalid Input--Try Again****" ;1000=76h,FFh

;Program Variables
OldLine DEF8 0 ;1000=76h
NewLine DEF8 0
Step DEF8 0
Pointr DEF8 0
Buffer DEF8 0Dh

```

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DESKTOP PUBLISHING ON THE TS2068

Duncan Teague

Desktop Publishing and "THE NEWSROOM"

In the spring of 1985 a revolutionary new software program left an indelible impression on the computer world. It was the first ever "desktop publishing" program, Springboard Software's "The Newsroom."

Its popularity and its notoriety grew as people readily learned how to create documents more sophisticated than posters, greeting cards, and ribbon-eating banners and more eye-catching than word processor text files.

"Newsroom" permitted the combination of words and pictures in the same document. This is no simple task, since the computer treats alphanumeric characters and graphics differently.

When you show a picture on, for example, an Apple computer, you must use the command "text" to clear the screen graphics mode and restore its ability to print Applesoft BASIC commands on the screen.

Both words and pictures consist of patterns of dots, either on the computer's display screen or on the printed page. The dot patterns for the letters, punctuation symbols, and miscellaneous characters on the computer keyboard are permanently stored in the computer's ROM, since they are used over and over again. The dot patterns for a picture are temporarily stored in a designated area of RAM which often encompasses an entire screen full of dots.

An individual keyboard character will take up only a single byte. It can be placed in many different areas of memory. This copy of Tasword stores any one character as a single byte in any of 19200 addresses.

A T/S 2068 picture, a SCREEN\$, if you will, is stored as a single block of 6912 bytes in one specific area of memory. This is known as the display file, and it starts at address 16384.

Apple computers use a couple of "hi-res pages" to store pictures. Hi-res pages 1 and 2 are found at addresses 8192 and 16384. Each page utilizes 8192 bytes of memory.

"The Newsroom" reconciles the inherent differences between words and pictures by treating them both as graphics. That's the way "Newsroom" documents are printed, in the printer's bit image graphics mode. This allows the letters used in the document to look as pretty as pictures.

"Newsroom" can print five different fonts, styles and sizes of letters. They include small and large versions of serif and sans serif letters plus a large English font. What's special about "Newsroom" is that you can type these letters on the same screen with a picture by means of a rudimentary word processor. The word processor allows insertions, deletions, and word wrap.

"Newsroom" also has some slightly better than rudimentary graphics tools which help you draw your own pictures to include with the text. If you're not an artist, you can use pre-drawn pictures included with the program, stored on disk, which may or may not be exactly what you want. These pictures are called "clip art" since you can "clip" them from one location and merge them into your work area.

The work area is called a "panel." Six or eight panels, depending on the size paper you're using, plus one double width picture, called a "banner," comprise one document. You arrange the panels under the banner in two columns.

Desktop Publishing for Timex/Sinclair

"Newsroom" is the prototype, the yardstick by which desktop publishing software for Timex/Sinclair and/or Spectrum computers can be measured. There are more sophisticated programs available for more expensive computers now, but "Newsroom" can serve as a guide to the basic features of software for the production of newsletter format documents.

There are currently two programs available for desktop publishing on the T/S 2068: Stan Lemke's "Pixel Print Desktop Publisher" and Charles Stelding's "Desktop Page Editor." Each author uses a different approach to simultaneous manipulation of text and graphics.

"PIXEL PRINT" Desktop Publisher

"Pixel Print 2.0" is actually the third version I have received. Each revision has been in response to user comments, and has made a substantial improvement in the capabilities and ease of use of the program.

"Pixel Print" synergically operates with other members of a family of software. "Pixel Sketch and Graphics Editor" allows you to create original artwork. "Icon Package" provides you with a library of 102 pieces of clip art which can be merged into

Pixel Sketch SCREEN\$'s. "Font Package" provides six new fonts, in addition to the CHANCERY font which accompanies both Pixel Sketch and Pixel Print, for producing snappy looking text for the documents Pixel Print produces.

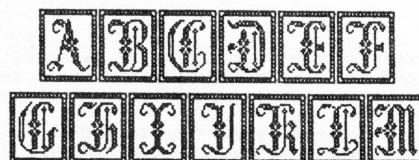
Font Package:

"Font Package" consists of two cassettes. One contains a Font Designer and a Font Downloader for the Star SG-10 printer. The other stores a "library" of seven fonts. The Font Designer allows the user to create new fonts or modify existing fonts.

Font Designer displays the dot patterns, expanded 64 times, for each of the characters in the ASCII character set. The dot patterns can be altered by turning character-sized "pixels" on

SAMPLE ICONS AND FONTS FROM LEMKE'S "PIXEL PRINT" SOFTWARE SERIES.

HERE'S "MODERN-HEADLINE" FONTS. BELOW ARE SOME "MONOGRAM" ICONS.

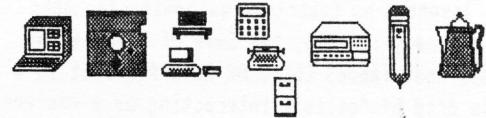


This font is "Bold-IBM," and the icons below deal with animals...



I especially like the "Opus" icon. The comic strip Bloom County is one of my favorites.

This is the "Standard-MICR" font which looks appropriate with the "home and office" icons.



This font is "Adventure." The icons at the left are related to children.

This font is "EUREKA" This font is "STENCIL" This font is "WIDELOAD" This font is "THESPIAN"

This font is "WESTERN" Below is "PERIPHERAL" font.



or off. The resulting pattern can be redesigned, if you're not happy with your changes; kept and stored in its new form; or restored to its original form, if you decide not to change it.

Existing fonts can be sweepingly modified by having bold, modern, and italics versions of themselves created with a few keystrokes. As with Pixel Sketch, the effect of these modifiers is cumulative. You can create a bold-modern version of a font, a modern-italics version, or any combination including all three at once. The calculation of the total number of possible fonts that can be created from a single font with modifiers used alone or in combinations is left to the reader as an exercise.

The new font resulting from your design efforts can be placed into a library of up to 20 fonts (so multiply your answer above by 20). Font Designer keeps track of the number of fonts, their names, and their positions within the library. It saves and loads them sequentially. Many different libraries can be maintained up to the limit of your tape (or disk) budget.

The Font Downloader will revise the font your printer uses by sending new dot patterns for the characters to the printer's RAM, if your printer has this capability. You could, ostensibly, use any of the fonts in your library with Tasword. The font would take up no program memory. It would be in the printer's RAM.

Stan thoughtfully wrote this utility in BASIC so others, smarter than myself, could write their own versions of Font Downloader for their own printers.

I spent about an hour and a half each designing seven new fonts for my own use. It's a tedious but rewarding process, made simple by Font Designer. Warning: I saw an eight by eight grid containing little white squares in my dreams for a week.

Icon Package:

"Icon Package" consists of a library manager, designer, and converter packaged as three separate programs on one cassette. A second cassette stores 102 different icons which can be loaded into the library.

The Library Manager will hold up to 115 icons, so you have the opportunity of storing a few of your own creations without having to start another library. Each icon is 58 pixels high by 32 pixels wide in the Zebra (Greeting Card Designer) format.

The Library Manager contains a utility to resize each icon to two or three times its original dimensions (four to nine times its original area) and its conversion to SCREEN\$ format. Before the icon is saved in its new form, the option is given to place a one pixel wide frame around the image.

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SAMPLE NEWSLETTER PREPARED WITH LEMKE'S "PIXEL PRINT" DESKTOP PUBLISHER AND AN 80 COLUMN PRINTER.

Page 2

<p>Pixell Print Press</p> <p style="text-align: center;">Pixel Print Press</p> <p>DESKTOP PUBLISHING ON THE TS2068</p> <p>STAN LEMKE ::::::::::: Publisher</p> <p>STAN LEMKE ::::::::::: Publisher</p> <p>Published 4 times a year (Fall/Winter/Spring/Summer), to owners of Pixel Print and its related utility programs.</p> <p>For a 1-year subscription, send 4 Business-size SASE to:</p> <p style="text-align: center;">Lemke Software Development 2144 White Oak Wichita, KS 67287</p>	<p style="text-align: center;">Fall 1987</p> <p style="text-align: center;">Tools of Life</p> <p style="text-align: center;">Triangle</p>	<p>With any type of work, tools are very important. Imagine a plumber without his wrenches... an artist without his brushes... an accountant without his ledger... No worker can do his job well without proper tools. The same goes for Desktop Publishing. Even though the field is in its infancy, the tools used have been around for some time.</p> <p>The basic tools for Desktop Publishing can be divided into hardware and software. The standard hardware includes the computer, along with peripheral units such as printers, disc drives, etc. This area we will discuss in a future issue.</p> <p>This time we will look at the needed software. It probably will come to no surprise that most software used in Desktop Publishing involves text and/or graphics.</p> <p>For formatting text, a Word Processor is a must. For use with TASHORD TWO we recommend TASHORD TWO for MS/PC.</p> <p>There are two reasons for this. First, TASHORD utilizes a DISKFILE (What You See Is What You Get) screen format. Also, TASHORD, PIXEL PRINT conversion program is available.</p> <p>This utility enables you to</p>
<p>1. To further the ideals of C/S computers in Desktop Publishing 2. To further the ideals of C/S computers in general!</p>		

This proved to be quite useful. I saved each icon in its original size as a separate SCREEN\$. Then I combined selected icon SCREEN\$'s with Pixel Sketch's "merge screen" function to group the icons into related sets on a single SCREEN\$.

I now have seven SCREEN\$'s which can be used just like "Newsroom's" clip art. Each icon can be selected for use, again with the "merge screen" function, for any new picture I want to create. (I decided to use the smallest size for each icon, instead of the double size or triple size. Pixel Sketch has the capability of resizing graphics with its "zoom" function.)

The Icon Designer, the second program on the Icon Package cassette, will, as its name suggests, let you design a new icon and save it in Library Manager (Zebra Graphics) format. The new icon can then be loaded into the library.

LARKEN ELECTRONICS

DISK INTERFACES

----- LARKEN 2068 / Spectrum DISK SYSTEM -----

- The system consists of the LKDOS cartridge and a Double Density rear disk interface. 800K on a Quad Drive
- Fully 2068 / Spectrum compatible / OS-64 compatible
- It uses all standard (Token) keyboard cassette commands CAT MERGE ERASE FORMAT LOAD SAVE PRINT and more
- Uses NO RAM space. HAS 8K ROM and 8K RAM on board
- NMI Memory Save Feature : PUSH-BUTTON program transfer
- A KEMPSTON compatible Joystick port is also on the IF.
- Also, 10 Extended Basic Commands for Graphics, Utilities and up to 3 scrolling Windows on the screen. An Aerco compatible printer driver is also in the Lkdos Cartridge
- The disk interface is a compact rear mounted board that can support 1 to 4; 3" 3.5" or 5.25" SS,DS or Quad Drives
- Easy to setup. 90 day guarantee

*** ATTENTION *** AERCO FD68 and RAMEX DISK USERS

The LKDOS cartridge is now available for your disk IF's. It will allow your disk systems to be fully Spectrum and OS-64 compatible and Larken disk compatible and have all the commands mentioned above. Also a SNAP-SHOT save button can be added. RAMEX users will now be able to use all the memory.

AERCO users can now have all of the above features plus the Lkdos uses the Aerco Ram as a RAM-DISK !

PRICES : (US)	2068/Spectrum Disk System	\$119.95
Add \$5 S&H	LKDOS Cartridge (Aerco, Ramex)	\$65.00
	ZX-81 Disk Controller	\$99.00
	256K Non-Volatile Ram Disk	(TBA)
	Drive Floppy cable	\$8.00

* LARKEN ELECTRONICS RR#2 NAVAN ONTARIO CANADA K4B-1H9 *

The design screen has a vertical rectangle subdivided into 1856 cells (58 high by 32 wide). A cursor moves, under joystick control, to any cell, changing it from paper color to ink color if that cell (pixel) is to be "set" in the final design. Cells can be erased, thus re-setting that pixel in the final design.

This process is more tedious than designing a font - about 29 times more tedious. If I reason the price charged for the Icon Package to be just under a paltry 20 cents each for the 102 icons, then the library, designer, and conversion programs are essentially free! Buying future Font Packages is cost effective.

The final program is a Colossus Conversion Utility for putting the icon into the format required by Lemke's "Colossus Graphic Banner" program. This does not relate to the concept of desktop publishing, but it does show Lemke's commitment to the support of his entire line of software.

Pixel Print Desktop Publisher:

The "meat" of this whole package is Pixel Print. (Actually it is a steak.) Pixel Print allows the loading of SCREEN\$ format graphics and the insertion of text above, below, or onto the picture itself with pixel level resolution. You're not limited to the standard T/S 2068 character positions.

A judicious choice of keys permits the user to scroll a "window" on a page high column toward the bottom - B, b, or TO - or toward the top - T, t, or THEN - respectively 8 rows, 1 row, or 1 pixel row at a time.

Other keys allow the repositioning of the graphics and/or text. The AND, OR, NOT, and STEP commands move selected portions of a column respectively one pixel to the left, right, up, or down. The selected column segment that is moved depends upon the position and size of a black, rectangular "text cursor."

Still other tokens allow pixel level adjustment of the text cursor's position. The <=, >=, THEN, and TO keys move the cursor one pixel up, down, left, and right respectively.

The latest version of Pixel Print provides "block" commands to copy or erase screen segments and to insert or delete pixel rows. The block functions are available from a separate menu. What blocks or segments of the column are copied or erased and the position at which pixel rows are inserted or deleted is determined by the text cursor's position and size.

The text cursor's size is adjusted by selecting W for "wide" or H for "high" from the main menu, a two line prompt area below the work screen. It can be as small as 1 by 1 "normal" character size or as large as 32 by 22! The shifted 5-8 keys move the cursor one character of the selected size.

Text can be placed on the screen in any font you choose. The current font can be modified to its bold, modern, or italics version as previously described, or a new font can be loaded and modified. You can return at will to the standard character set.

It's necessary to exit the menu mode when you want to add text to your document. Underline can be toggled on and off by pressing the underline character. The typing is somewhat slow, especially when you've chosen larger than normal size letters.

Pixel Print formats the graphics and text into a single column 1 screen wide by 4-1/3 screens high. Two columns almost completely fill an 8-1/2 by 11 inch sheet. You can POKE two addresses to set print positions for left and right columns and thus set the margins and the space between columns.

You can print out a single column double its normal width and length. One double size column fills two consecutive sheets. Thus filling the top half of a column with text and/or graphics and printing double size makes a "poster" or "sign." One more POKE lets you adjust the double size print position.

SAMPLE NEWSLETTER PREPARED WITH STELDING'S
"DESKTOP PUBLISHER" PROGRAM AND 2040 PRINTER.

Announcing A New Software:

TIMEX 2068 DESKTOP PAGE EDITOR

Vol. 1, No. 1

February 1987

New Program Features Easy "Paste-Up" Arrangement For Bulletins Reports, Announcements, Posters, Presentations and Handouts

"Desktop Page Editor" is now available for the Timex SINCLAIR 2068.

Editing is a method of putting text, headlines and artwork anywhere on a page for newsletters, announcements, posters and reports.

The program allows you to "paste up" a page as you want it with complete control. Even SCREEN\$ which you create can be placed anywhere on the page!

The normal text font is in a bold format for easier reading and easier copying on the 2040 Printer and other printers, but you can use other text fonts by loading them in memory. Several font styles come with the program (old English, Italic, "Data", modern, or you may create and use your own).

text is automatically arranged so that words without room at the right end of the line are placed in their entirety on the next line. All you do to enter your text is to simply type the paragraphs in REM statements.

Other features include a line editing function which allows you to correct and re-size lines and proper spacing within a line. This feature also allows you to put a design around the text as this paragraph illustrates.

The SCREEN\$ function lets you create a design, illustration, artwork, etc. on a separate program (not included), save it as a SCREEN\$ and then load it into the program. You may load the entire 22 line SCREEN\$ or only a part of it such as the first 3 lines of the SCREEN\$.

This mode can also create a "banner" or headline for your document. The uppermost portion of a single column can be used to create the double size banner. Two slightly shorter columns can be used to create the main body of the newsletter.

It's possible to perform periodic "keeps" of your work area by pressing "K." The current work screen is stored in memory. It can be brought back to the work area by the "U"ndo command. The "Keep" function is automatically performed when loading of new graphics or new fonts takes place.

The main body of the program has been compiled, but the I/O functions of saving and loading are left in BASIC. This allows easy conversion for mass storage devices. The choice of ink and paper colors is left to the user. Editing one line is necessary.

Thorough instructions are provided for the customization of the built-in print driver for the characteristics of particular printers. Follow the directions. It will work the first time.

Those new to the concept of desktop publishing will find the sample column included in the package most helpful. You can manipulate the sample to familiarize yourself with Pixel Print techniques before attempting your desktop publishing adventure.

Purchasers and other interested parties are asked to send 4 SASE's so they can receive a quarterly "Pixel Print Press." The publication will contain user submissions and hints and tips on optimum use of the Pixel Print family of software.

"DESKTOP PAGE EDITOR"

An entirely different approach has been taken with "Desktop Page Editor." Both columns of a 2-column document can be handled in memory at once. The columns can be viewed in their entirety by consecutive scrolling 20 rows at a time. You can examine both columns simultaneously, displaying the left half of each. Neat!

Sacrifices, however, must be made. It's necessary to type headlines and load graphics into a "source file" before typing text. Also, text must be entered in standard character positions and can't be used to "label" SCREEN\$'s in the source file.

"Headline" letters can be 2-5 rows high and 1-2 columns wide. The font you use can be chosen from among three in a Font Maker utility. Fonts are loaded in command mode, not from menu.

Headline letters are displayed in outline format. You can either "fill" the letters or create a "shadow" effect. Filled and shadowed fonts other than standard can be hard to read.

A SCREEN\$ can be loaded, but you don't have to use all of it. When the picture is displayed, you press the ENTER key to scroll the graphic a row at a time. The portion disappearing off the top of the screen is what is placed into the source file.

A "text editor" is used for text entry. Alternately you can enter text in REM statements and store it in the source file. "Format" handles this function and provides word wrap.

A total of 160 lines can be placed into the source file. This includes 22 lines for each full SCREEN\$. The program tracks the number of lines used and the number remaining.

To arrange the page layout as you would like it to appear, you view the source file and decide which numbered lines you want to move into your document. You choose where to place the selected portion of the source file, in column 1 or 2. Then the unshifted arrow keys move a UDG arrow to the correct line of your displayed document. The "D" key does the actual placement.

Printing of the document is handled by user supplied print driver. The driver must COPY 22 lines of the screen without any extra linefeeds. You must edit one program line to replace the COPY command with the necessary RAND USR call.

The printout has markers designating the tops and bottoms of the two columns. You must cut the two columns apart and paste them together to form a single document.

I tried several versions of my Aerco print driver. None of them worked satisfactorily. All versions copied 24 lines, not the 22 required by Desktop Page Editor. This means only that my print driver is incompatible. It indicates no program defect.

Summary

Desktop Page Editor is available from Charles Stelding, 1415 South Baxter, Tyler, Texas 75701. It costs \$19.95 postpaid. Pixel Sketch, Pixel Print, Font Package, and Icon Package can be obtained from Stan Lemke, 2144 White Oak, Wichita, Kansas 67207. Each is \$19.95, but you only need Pixel Print if you have a good graphics program. Pixel Print is more ambitious, more versatile, and better supported by auxilliary products. It's a better deal.

NEWS FLASH!! After this Desktop report was written a new utility was added to the PIXEL PRINT line by Lemke Software Development. The new "TASWORD to PIXEL PRINT Conversion" program allows the user to create a text file with the flexibility of Tasword and then convert the file to Pixel Print format... then any combination of fonts/icons are possible, as well as other graphics. Price for the Tasword program is \$19.95 ppd.

10 COMMANDMENTS OF GOOD DESKTOP PUBLISHING

Bill Ferrebee

By now, a number of you may be exploring the exciting world of Desktop Publishing. It's nice to know that you can use your TS2068 (and QL) to print your own newsletter for your user group or school, and have it look almost typeset.

Of course, as soon as I discovered "the power", I read every book and article on the subject I could get my hands on. I read everything from books dedicated to the subject, to the manuals for Desktop Publishing software for other computers.

Recently, I read an article I found very useful. It was entitled "Invasion of the Laser Crud" (PERSONAL COMPUTING, May 1987, pp 57-60). In it, Paul Saffo gave ten rules that will help to design a better document. Hence, the "10 Commandments of Good Desktop Publishing":

1. Be clear about your intentions.
2. Keep it simple.
3. Look for good models.
4. Keep font variety to a minimum.
5. Be sensitive to white space.
6. Produce several versions of the same design.
7. Get a second opinion.
8. Create a visual hierarchy.
9. Keep lines short.
10. Don't follow the rules blindly.

Now a brief explanation of each rule:

1. BE CLEAR ABOUT YOUR INTENTIONS. The best way to design a document is AWAY from the computer. Sketch your design with paper and pencil, then work it into the computer. This way, you will make the computer work for you, and not vice versa. Put yourself in the reader's place. What would look interesting to you?

2. KEEP IT SIMPLE. When I first started taking computer classes in college, one of my professors summed up the "Ultimate Programming Logic" quite nicely. "Use the KISS method," he said. KISS stands for Keep It Simple, Stupid! There's no need to make a layout look complex. This generally causes the reader to lose concentration and interest. Simplify, simplify, simplify... I can not stress this enough.

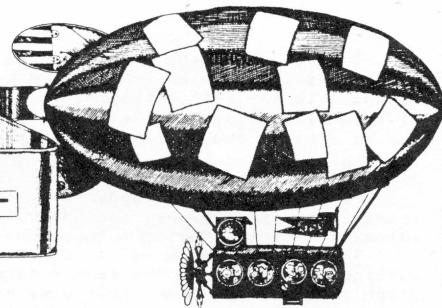
3. LOOK FOR GOOD MODELS. As the adage goes, "Imitation is the sincerest form of flattery". Keep your eyes open for layouts that interest you. Good places to look include other computer magazines, newspapers, even magazines like GOOD HOUSEKEEPING. I have started a file of sample pages from various publications. Anytime I want to try something different, I take out the file.

4. KEEP FONT VARIETY TO A MINIMUM. I know. Having the ability to use an endless variety of text fonts is like letting a kid loose in a candy store. There are so many choices. But as I stated in rule 2, simple is best. Stick to one or two fonts for the main text. Use bold or italic variants for emphasis. Finally, if you really want to "go wild", use other fonts for headlines or graphic captions. This way, you can keep your reader's interest, and remove the "static" from the look of your document.

5. BE SENSITIVE TO WHITE SPACE. In publishing, blank space on a page is as important as the text and graphic content. It helps to separate sections, and draw the reader's eyes to highlighted portions of the page. Use white space as a "walkway" around the page. Leave enough so that you can move around without bumping into things.

6. PRODUCE SEVERAL VERSIONS OF THE SAME DESIGN. Publishing on a computer allows you the freedom to make changes to your ideas quickly and easily. Before you

TIMEX sinclair



settle on one particular layout, print several different ones. Then put them away, and go do something else. Later, go back and look them over again. I've found that after placing my concentration on another activity for awhile, I can be more subjective on what I have created.

7. GET A SECOND OPINION. And maybe even a third. Give your product to someone else to critique. Earlier, I said to put yourself in the reader's place. Now, let the reader make the judgement. Remember, any criticism a person may give you is to help you IMPROVE the product. So take any criticism graciously.

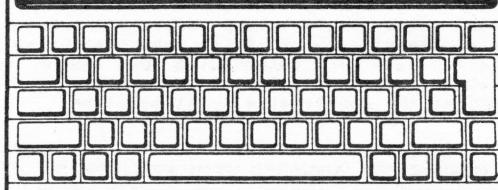
8. CREATE A VISUAL HIERARCHY. Basically, this means to place your text and graphics to read left to right, and from top to bottom. Place as few breaks in an article as possible. Breaking an article over a number of pages causes a reader to lose interest. This is commonly known as the "flow" of a document.

9. KEEP LINES SHORT. Again, if your lines of text stretch too long, you will lose the reader's interest. Generally text should be no longer than 10 to 12 words per line.

10. DON'T FOLLOW THE RULES BLINDLY. Consider the 10 rules (commandments) more as guidelines. Don't be afraid to experiment. If you like what you see, USE IT!

I hope this information is helpful to you. If you have any comments or suggestions, drop me a line.

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Shoot-out at the QL Desktop Corral!

Mike de Sosé

The popularity of so-called "desktop publishing" programs has zoomed upwards in recent months--every TV ad for major brand computers emphasizes their desktop publishing capability. It is the new computer craze!

And the QL world has not been spared. Within the past few months we have seen Gap Software's FRONT PAGE, Digital Precision's DESKTOP PUBLISHER, Gap's FRONT PAGE EXTRA, the QUANTA library's PAGE DESIGNER, and now DP's DESKTOP PUBLISHER (Special Edition), all outgrowths of graphic-arts programs with more elaborate methods of handling text in conjunction with graphics, particularly oversized or fine print and text in columns.

In this issue of TDM and the next we'll compare the latest of these desktop programs to better enable you to make the proper choice in purchasing one or another, if you want to get on the bandwagon.

First a little philosophy. You probably don't need such a program. They are costly and time-consuming to learn and operate and oh-so-slow in printing unless you can afford some very expensive printer or plotter. For many decades, complex reports such as academic and scientific dissertations have been produced in normal typewriter typeface--models of clarity and exposition; many books have been published to tell us how to do this and most major publications have their "stylebooks." So, if you keep it in mind that desktop publishing is probably a passing fancy and very much oversold, it may give you a better perspective (and a proper contempt) for such software.

Second is the matter of good taste. Desktop publishing carried too far often results in documents with a "kitchy," gingerbread appearance which may offend or distract the reader (or viewer, perhaps), detracting from the intended effect of your unassailable logic and riveting arguments. (I am reminded of an Air Force general who told a brilliant officer--no, it wasn't me--who had just proposed profound and well-founded recommendations regarding the command's wartime mission to get a haircut, shine his shoes, and shave off his mustache.)

Third is the matter of efficiency. We have said that using desktop publishing programs is time-consuming and expensive. A good test of whether or not we should use such a program for a particular product is to reflect on whether the increased overhead will improve the cashflow (or your personal reputation) commensurately. As a management analyst, I can assure you that most of the reports prepared using such software is makework! Placing text in columns seems to be a major attraction to desktop publishers, but any word-processor may be used to produce text in narrow columns which may then be cut and pasted together and then copied quite easily. And any ergonomist will tell you that longer lines of text--up to 100 columns, perhaps--are easier and quicker to read than text in narrow columns.

Digital Precision's DESKTOP PUBLISHER, version 1, is a fairly comprehensive, graphics-oriented example of the current software craze--a text/graphics editor. Somewhat more comprehensive programs for major computer brands sell for from six to nine times as much and are now the featured software in prime-time TV commercials. A version 2 and a Special Edition of DESKTOP PUBLISHER (for 640K QLs) are now available--the latter, priced at about \$160, is said to rival the original Apple Mac PUBLISHER program which started the craze (at about \$900). DP's DP and DP (Special Edition) are, in the DP tradition, as complex as they are comprehensive, but are well worth the effort and expense for those dedicated and capable enough to use them--if, that is, you really need such capabilities.

Created using Digital Precision's Desktop Publisher

Gap Software's FRONT PAGE EXTRA is a text-oriented text and graphic-arts composition program selling for about \$50 in this country. FRONT PAGE EXTRA, hereafter FPE, is very user-friendly and straightforward to learn and use, and makes direct use of QL QUILT document (.doc) files which the original version of DESKTOP PUBLISHER, a more graphics-oriented and much more expensive (about \$100) program, did not. Following are examples of FPE user-defined graphics--UDGs--which are primitive by comparison with those intrinsic to Digital Precision's DESKTOP PUBLISHER, hereafter DP, but both programs readily import graphic-arts files prepared on other programs. DP is a far more comprehensive desktop publishing program than FPE which handles text better; the question is, *Is* comprehensive (and *Is* complex) a desktop publishing program do you want--and *want* to pay for? My recommendation, unless you are a dedicated graphic-arts editor of some ability, would be to opt for FRONT PAGE EXTRA while giving due admiration to my betters and the geniuses who developed DESKTOP PUBLISHER. The Queen's Razor award, however, should go to those practical types at Gap Software who, in FRONT PAGE EXTRA, did something about as simply and as elegantly as it could be done. Go, Gap!

Created using FRONT PAGE EXTRA



DESKTOP PUBLISHER * * * * *

Let's first consider Digital Precision's DESKTOP PUBLISHER, version 1.0 (version 2.0 and a Special Edition which requires a 640K QL were not available for testing and will be discussed in the next Time Designs). Version 1 requires a QL with at least 256K of additional RAM and is just too comprehensive to describe in detail in an article of this length--12 integral graphics fonts (sets of characters), 8 integral text fonts, 10 non-integral fonts, rotation, mirror-imaging, and shadowing of characters, etc., etc. One could go on and on. DPDP is partly menu-driven and capable of importing specially prepared QL QUILL document files. But with comprehensiveness goes complexity (and a higher price, \$100), and DPDP may not be for everyone.

FRONT PAGE EXTRA * * * * *

Gap Software's FRONT PAGE was the first so-called desktop publisher for the 128K QL. FRONT PAGE EXTRA is more comprehensive and requires a QL with 256K additional RAM. (On a 640K or 896K QL, this leaves lots of room for multitasking complementary programs such as QL QUILL, other Psion programs, and other text and graphic-arts programs. More text-oriented than DPDP, FPX is very easy to

learn and use and makes direct use of QL QUILL document files which it can "micro-justify" (by spacing between letters) into two, three, or four columns on a page. FPX is fully menu-driven with improved cut-and-paste, text font, user-defined graphics and file-handling routines. I have not yet been able to multitask FPX using TASKMASTER, but there is probably a way; I understand that FPX does multitask well using SWOPPER (about \$35). FRONT PAGE is available at about \$30 and FRONT PAGE EXTRA at about \$50.

I might add here that many desktop publishing ideas and formats are included in my new book Taking the Quantum Leap, available from Time Designs.

NEXT TIME: Digital Precision's DESKTOP PUBLISHER Special Edition and the bargain-basement PAGE DESIGNER from the QUANTA library.



Both Digital Precision's DESKTOP PUBLISHER and SPECIAL EDITION were obtained for this review from SHARP'S, INC., Rt 10 Box 459, Mechanicsville, VA, 23111, phone (804) 746-1664. Watch for further reports on D.P.'s newest Desktop Publisher "Special Edition" V2.0.

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SuperBASIC EDITOR FOR THE QL

Joe Newman

"The editor isn't very good" is a common complaint about the QL's SuperBASIC. The statement usually refers to the fact that there is no full screen editing of programs available on a standard Sinclair QL. I personally don't think the QL's line editor is that bad, but I will admit that many times I find myself trying to use "Shift 1" to edit a line. (Shift 1 is the edit command on the Timex 2068, but unfortunately not on the QL...all shift 1 does is print a copyright symbol!)

The problem is that many QL'ers (as QL Users are often referred to) don't realize that a very powerful, versatile, and full-function editor comes with the QL, absolutely FREE! Furthermore, it can even be used to rearrange a program totally a provide a print out as well. In case you haven't already guessed, I am referring to QUIL--better known in the U.S. as "QL Word Processor".

By using two simple "tricks", programs can be loaded into Quill for editing, or they may be created from scratch while in Quill, then loaded back into SuperBASIC. I have often heard people say this can't be done. But it can be, as I have done it, and will now explain how.

This first step must be done for either of the following: You must set up the proper print driver for Quill. To do this, put your mdv/disk with INSTALL_BAS (or FLP, etc.). Choose to edit typestyle OTHER, then set LINE FEED to LF and CONTINUOUS FORMS to YES. For further information on installing, see the QL User's Guide. Once this procedure is done, you can change the name "OTHER" to "PROGRAM", and hit F5 to install this driver. The best thing to do is set up a separate mdv cart or disk with Quill and this printer driver, so you don't have to keep switching drivers.

Now you can either edit a program or create a new one. First to edit an existing program: Add the proper LIS extension to your program's name. This MUST be done or you will not be able to load it into Quill. If you don't have a simple way of renaming a file on disk/cart. just load the file into the QL, DELETE it off disk or mdv, then SAVE it with the same file name, just with the extension added. For example, suppose you wish to edit a file called "Sprial". Simply LOAD MDV1_Spiral (or whatever storage device is used), DELETE MDV1_Spiral, then SAVE MDV1_Spiral_LIS and the procedure is complete.

Now execute Quill. Make sure the media containing your renamed file is in drive #2. hit F3, O, F, and then I. This chooses the FILE command and IMPORT's a file. Next, just type the name of your file (with or without the LIS extension) and hit ENTER. You will then be asked if you wish to import by line or paragraph. Choose "L" for line. Quill will now load in your program, all ready for editing. Don't use any alternative typestyles or control codes for printing, as they will ruin the program. Be aware that some program lines that are no longer 80 columns will be scrolled off the right side of the screen. Just use the right arrow to move the cursor to these lines.

After you have edited your program, follow the step below that says "CONTINUE HERE FOR BOTH."

To create a program in Quill is even easier. Just execute Quill (with the proper printer driver installed, see above). Then start typing and editing your program lines as you wish. Don't forget that if you move program lines around, you should change the line numbers to read sequentially in proper order. Now just follow the step below.

CONTINUE HERE FOR BOTH: Once a program is edited to your satisfaction, and you wish to load it back into SuperBASIC, do the following: Hit F3, the P (for PRINT). Hit ENTER (twice only). This will bring you to the prompt which says "to printer". You want to print this file to "storage", NOT the "printer"...so type in a file name here. As you start typing, the words "to printer" disappear and are replaced by your new file name. Then hit ENTER and the file is "printed" to storage.

Leave Quill (you may wish to save the file normally first). It is ok to use the same name as the one you specified in the print command, as they are saved with different extensions. Reset your QL and get back to SuperBASIC. To load your newly edited program, just type LOAD, the drive name, the file name, and add the LIS extension. (i.e., LOAD MDV1_Spiral LIS). The LIS extension was added when you "printed" the file to the storage device. The program should load just like a normal program...all ready to go.

Have fun experimenting with this. If you have any trouble, questions or comments, please feel free to drop me a line at: Variety Sales, 325 W. Jersey St., #2D, Elizabeth, NJ 07202.

QL EASEL/BUSINESS GRAPHICS "TIPS"

Mike de Sosa

In 1985 when the QL first hit the market, the QL EASEL (BUSINESS GRAPHICS) program alone would have been reason enough for business offices to purchase a QL--so advanced was the program. (Even "Big Blue" IBM purchased a few QLs, possibly because of QL EASEL.) While still an excellent program, QL EASEL has been overtaken in the intervening years by business graphics programs with 3-dimensional bar graphs, built-in outline maps of countries and states, etc. But QL EASEL has no real rival for the QL.

TROUBLESONE COMMANDS & FUNCTIONS

QL Easel has a good HELP facility--one of the best tutorials for learning the ins and outs of the program. Key F1 and then F1 again to see how HELP works, then key ENTER

to get into the regular HELP sequence and proceed as directed. From within the program at any point, key F1 after you have selected a command or option for relevant HELP assistance. There is a curious omission in the QL EASEL HELP facility, however, that is, explanation of the eleven QL Easel functions: ABS(n), ATN(n), COS(n), EXP(n), INT(n), LN(n), PI(), SGN(n), SIN(n), SQR(n), and TAN(). (QL EASEL functions are used in formulas which may be used to determine the value of a bar, line entry, or segment and are commonly used to create whole new sets of figures at one swoop.) Function use is pretty straightforward, but for details you must consult your QL User Guide or another source. Function names must be immediately followed by parentheses

Have you ever wondered just **WHAT** the QL sound system can do? Well, WE DID! This little program written in SUPERBASIC, will allow you to find out exactly **HOW** you can make use of the **BEEP** command in your QL programming. A few keystrokes and you can create, change and play the sound that you are trying for!

SOME OF THE FEATURES OF THIS PROGRAM:

CHANGE: DURATION-FUZZY-PITCH1-PITCH2-GRAD_X-GRAD_Y
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enclosing a single number or numerical expression which the function transforms; PI() is an exception: its parentheses are always empty.

Change is a powerful, omnibus command which permits you to modify how a graph will look in every respect: its format, bars, lines, axes, colors, background, labels, etc. Often overlooked is that any bar format may be converted to a line-graph format using *Change* and the *Line* option; each set of data represented by a bar will have to be converted (select *Olddata* before selecting *Change*) separately. Graphs incorporating both bars and lines (and don't forget the use of "filled lines" as a backdrop) are often quite effective. The *Axis* option of the *Change* command permits you to, among other things, change axis limits (after selecting the *Axis* option, key ENTER, select the "?" option, and select *Change axis limits*): axis limits can be selected to be automatic, manual, or automatic with zero always shown. (Some data analysts insist that the zero value must be shown on a graph to put variations in true perspective; it is true that data fluctuations may be misrepresented by omitting zero values on the vertical axis of a graph.)

Default is used only to select the column-width of the printed or viewed graph.

Edit, like **Change**, is a powerful omnibus command frequently used in conjunction with the **Text** option of the **Change** command to put the finishing touches on your graphs.

Files, another omnibus command, puts you into the file management mode in which you can format Microdrive cartridges, disks, or RAMdisks and backup, delete, import, or export QL EASEL files.

Highlight is used to emphasize a particular value in a barchart or piechart or all negative values.

Be sure you understand all of the functions of the **Newdata** and **Olddata** commands.

Print prints the displayed graph; three options are offered: *Print* the graph; *Screen* dump the screen to a named backup file; and *Install* to install a new printer driver.

GL EASEL FORMULAS

It should be kept in mind that QL EASEL is designed to work hand-in-glove with QL ABACUS: imported data in the proper format is converted directly into graphic form. No numeric values are calculated and displayed as such in QL EASEL. For example, the QL ABACUS spreadsheet

	A	B	C	D
1	cashflow	Jan87	Feb87	Mar87
2	costs	500	700	800
3	sales	1000	1100	1200
4	profits	500	400	400

if exported and then imported into QL EASEL, would be seen as three sets of figures named *costs*, *sales*, and *profits* with cells labeled *Jan87*, *Feb87*, and *Mar87*, respectively. There are rather strict rules for the file structure of export files. See the *Information* section at the rear of your *QL User Guide* for further guidance.

Formulas may be used to change an old set of figures or to create a new set:

figures = figures x 2

or, *newfig = figures / 2*

QL EASEL interprets input data preceded by a quotation mark as text, input data beginning with a number as a number, and input data beginning with the name of a set of figures or a function name including the name of a set of figures as argument as a formula.

Two reserved keywords are used in QL EASEL formulas to speed-up graph-making: **cell** which is equal to the cell number in a bargraph counting from left to right and **cellmax** which is equal to the number of cells displayed in the graph. The latter is commonly used to adjust the scale of the horizontal axis in a bargraph, for example,

```
curve = sin(2*pi()*(cell-1)/(cellmax-1))
```

draws one complete sine wave regardless of how many cells are displayed.

PHOTOGENIC GRAPHS

Making 35mm color slides of QL EASEL graphs is about the quickest and least expensive way to display business (and some scientific) data in a quality manner. For smaller audiences--up to six, say--you could give a presentation directly from the monitor screen.

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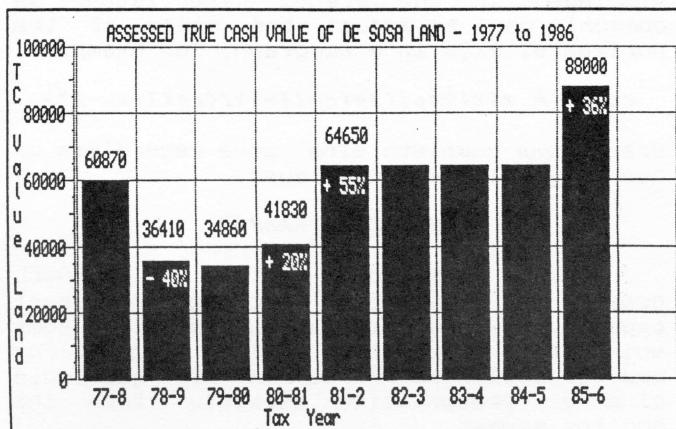
Use a single-reflex 35mm camera on a tripod, preferably, but not necessarily, with a short telephoto (85-100mm) or macro lens. Adjust your tripod legs (you may want to make marks on your floor for future reference) and centerpost so that your camera lens is perpendicular (in two planes) to the monitor screen and that your viewfinder displays a focused image of the monitor screen. (Check the top, bottom, and corners of your viewfinder to see that all is in acceptable focus with your lens stopped down to f5.6.)

If you use a shutter speed much faster than 1/8 of a second, your picture might be lost. Using ASA 100 color-slide film, bracket several exposures around f5.6 and 1/4 second. Reflections, even at night in a darkened room, present problems. I use a 4x6 foot lightweight black cloth thrown over the monitor, camera, and me--just like the old-timers. If you have the necessary equipment--little is really necessary--and want to develop the slides yourself, buy film that uses the E-6 process; there are several choices.

One could develop a cottage industry around making 35mm slide presentations for various business and other groups in your community. Become a graphic artist!

A PROFITABLE EXAMPLE

Shown below is an example of a QL EASEL printout which served to win me a \$24,000 reduction in the estimated true cash value of my property for tax purposes a few years back.



Many other tips for using QL EASEL are included in my new book Taking the Quantum Leap, available from Time Designs magazine.

QL TURBOQUILL+

A few months ago, I recommended a QL QUILL accessory program called TURBOQUILL. Its greatly improved and enhanced big brother is now available. Not only does the new version speed-up QL QUILL processing, it also changes the QL QUILL cursor to white when CAPSLOCK is on. An important enhancement is the inclusion of a Glossary Function with which you can define the function of 22 alphabetic keys through an automatic Learn Mode. The defined-key sequence may be a command or text string and may be used to set the defaults within a given QL QUILL document, to set other defaults in mid-document, or to load text segments or entire documents. The "S" key definition is activated immediately after QL QUILL start-up, permitting the automatic setting of defaults, printing of letterheads, etc.

QL TURBOQUILL+, compatible with SPELLBOUND and TASKMASTER but not, apparently, with QRAM, is available from Athene Consultants, 33 Holly Grove, Fareham Hampshire, PO16 7UP, U.K. (telephone 0329 282083) for about \$20, including AIRMAIL postage. BE SURE TO SPECIFY YOUR VERSION OF QL QUILL/WORDPROCESSOR, FOR EXAMPLE, VERSION 2.3.

FILEBOUND RHYMES WITH SPELLBOUND

A drawback of Sector Software's excellent spelling-checker, SPELLBOUND, was that it could not be used to proofread already existing (the more literate will excuse the redundancy) QL QUILL or EDITOR documents. But PDQL Computer Systems and Software--an excellent British company--has come to the rescue and produced a low-cost patch program which modifies existing documents so that they can be proofread using SPELLBOUND and, as a bonus, can create lists of words that may be added to the SPELLBOUND dictionary. FILEBOUND is available from PDQL, Unit 1, Heaton House, Camden Street, Birmingham B1 3BZ, U.K. (telephone 021 233 3042) for about \$10 and a Microdrive cartridge.

NEXT TIME: DEALING WITH QL TRUMP CARD AND ITS 896K RAM, and more new equipment.

THE ZX81/TS1000 LIVES ON!

SILICON MOUNTAIN COMPUTERS announces TRUE HIGH RESOLUTION SOFTWARE for the ZX81/TS1000. You read it right! Without any expensive hardware add-ons, your computer can now run software that even its designers never dreamed possible. Thanks to an amazing discovery by Wilf Rigit, and innovative programming by Gregory Harder and Fred Nachbaur, you no longer have to suffer the "low res blues." Multiple character sets, 256x192 graphics, 64-column screens, UDG's, even SPRITES are now available for your computer!

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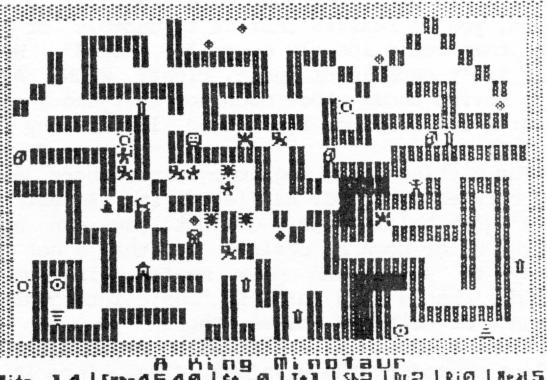
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To introduce you to the wonderful world of HIGH RESOLUTION on the ZX81/TS1000, we're offering these "loss leaders" for your enjoyment. These are all excellent programs, and will demonstrate beyond reprise that you really do own a REAL computer! Get any title for only \$9.95. Get any three on one tape for \$21.95, or ALL FIVE for only \$30.00. We even give you permission to circulate these amongst your friends... have you ever seen an offer like this?

**** HI*RES CHESS UPGRADE **** (As published in SYNCWARE NEWS.) This upgrade for the Psion (Timex) CHESS program gives you real chess pieces on-screen. Very impressive!

**** HI*RES BLACKJACK **** (As published in Time Designs.) A very graphic (pun intended) demonstration of the power of SRAM HI*RES EXT. BASIC. Closely parallels the casino game. Allows multiple decks. Graphics you NEVER thought you'd see on your TS1000!

**** YEAR-AT-A-GLANCE **** Another nifty SRAM EXT. BASIC application. Shows an entire year (1800-2099) on a single screen! Comes with comprehensive "appointment book" file options.

**** MACRO-LIFE **** Greg Harder's adaptation of Toni Baker's Spectrum implementation of the classic GAME OF LIFE. Fascinating study of computer-generated patterns!

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- * TS2040 and "big" printers supported, via any of the popular interfaces.
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Finally, a REAL terminal package for your computer. Comes with a very comprehensive manual; it even has a large section on "Useful POKEs" for customizing to your tastes.

The price is the clincher...ONLY \$24.95 !!

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MoTSart

Super Music for the ZX81/TS1000/TS1500

Zack Xavier Haquer

The ZX81-type computers don't have "sound", right? WRONG! If you ever listened to a tape of a computer program, you'll realize that it is capable of screechy noises that could loosely be called "sound". Well, ok, but it isn't capable of music, right? WRONG AGAIN! If you've envied those other machines that can beep out a tune or a laser sound, there's no longer any need to feel left out.

The machine-code program presented here gives you three octaves of sound. As listed, the lowest note is the "A" just below "Middle C", but you can move your spectrum up or down as desired. But that's not all; it is easy to write and play music using only BASIC commands, thanks to a built-in "music interpreter". No, you can't do multiple voices (though you can simulate two voices as shown in the demo), and you can't vary the envelope or modify the waveform. Also, since it has to run in FAST mode, you can't see your display screen while the music is playing (unless you have the Olicer video upgrade). Still, this relocatable machine code routine might be just what the conductor ordered to tune in your BASIC software.

You won't need much in the way of hardware. If you wish, you could connect a mic-level amplifier/speaker to the MIC output. Alternately, simply use your cassette deck. Connect the MIC from the computer to the MIC jack on the recorder, and connect an earphone or a small speaker to the EAR jack of the recorder. Then take an old useless cassette, and cut or remove the tape, making a "dummy" cassette. This will allow you to place the recorder in RECORD mode without actually recording anything. Or you could, of course, simply save to tape, and listen to your computer sonata after it has been recorded. Finally, a cheap AM radio located near the computer might pick up the sound, but with reduced quality.

The machine-code routine takes up exactly 256 bytes. It is fully relocatable, so you can place it anywhere you want. A good place is in a 1 REM statement; this article will assume that this is where you'll want to put it, but remember that you can move it elsewhere if you wish. Simply change the LET BEEP= statement to match the start of your code.

Also required is 144 bytes after the code, for the frequency/duration lookup table. So start by entering a 1 REM followed by 400 X's or other character. Use a POKER program such as LISTING 2 of the "Kaleidoscope" article in TDM Vol.3 No.1. You only have to change line 3 to read: FOR A=16514 TO 16769. RUN your loader program, and enter the decimal values given in TABLE 1. When you're done, delete the loader lines and enter line 2 and lines 9000-9991 of LISTING 1. (Incidentally, if your listing gets stuck at line 1, be sure you have a line 2, then LIST 2 followed by POKE 16419,2.) RUN 9000 to generate the data table. When it stops, enter CONT to fill the rest. Line 9170 may be removed to speed up the process; it is included to show the significance of the various data elements.

Each entry in the table corresponds to one of the 36 possible notes, and consists of four bytes. The first two give the "delay constant" that determines the frequency of the note. (We call this "BC" in the program since this is the register pair used for this purpose.) The second two bytes give the number of cycles required for each note, at the minimum possible duration.

The signal generated by the routine is perfectly symmetrical (50% duty cycle). The minimum ON and OFF time (BC=1) is 199 "T" states, and each increment of BC increases this time by 26 T states. Though the actual clock frequency is 3.5 mHz., the "effective" clock frequency of the machine is 3.192 mHz. (T-states per second) because of the keyboard-sensing routine in the non-maskable interrupt. So, the frequency outputted will be:

$$\text{FREQ} = 3.192E6 / (2 * (199 + 26 * (BC - 1)))$$

By transposing this equation, the value of BC for a given frequency is:

$$\text{BC} = 1 + ((1.596E6 / \text{FREQ}) - 199) / 26$$

Each note (half-step) will be a fixed ratio higher in frequency than the previous one. Since there are 12 half-steps per octave, and each octave represents a doubling in frequency, this ratio is $2^{(1/12)}$. The program calculates each frequency using this ratio, and prints it as the first entry in the screen table. From this it calculates BC, and then "back-calculates" the ACTUAL frequency which will result. (Since only integer values can be POKEd, there will always be some imprecision in the actual frequency.) Finally, it calculates how many cycles of each note are required for the minimum time interval (sixteenth note at the fastest tempo).

The "A" below Middle C is defined at 440 Hz. You can move your scales up or down by changing line 9040. For example, to move it down an octave LET FREQ=220, to move it up an octave, LET FREQ=880, etc. You can even transpose music to different scales by using other values. For instance, if you wrote a piece in the key of C and wish to transpose it to E (4 half-steps higher), simply define your lowest "A" to C# (LET A=554.4).

When experimenting with different ranges, you should be aware that the lower notes, the more accurate the PITCH becomes. On the other hand, the higher notes, the more accurate the DURATION becomes.

After generating your table, enter the rest of LISTING 1. Then RUN for a demo. Enter the desired tempo (more about that later). A good tempo for the first music demo (line 100) is 180. Press any key when done for the second part (line 200) which gives a "laser" effect. Again press any key for a "siren" demo (line 300). Finally, press a key to play the second music demo (line 400), which shows how you can simulate two voices! A suggested tempo for this is 240. Pretty neat, eh?

Here's how "MoTSart" is used. Your BEEP command must always be of the form: IF USR BEEP THEN... where BEEP has been initialized to the start of the program (16514 in this case). What follows the REM are your musical commands and data. COMMANDS include semicolons ";" and commas ",".

A SEMICOLON is used to set the duration of the following notes. After the semicolon command must be a number or letter (1-G), defining duration as follows:

- 1 - Sixteenth note
- 2 - Eighth note
- 3 - Dotted eighth note
- 4 - Quarter note
- 6 - Dotted quarter note
- 8 - Half note
- C - Dotted half note
- G - Whole note



Values inbetween will give other (unorthodox) note durations. Once the duration has been set, it will remain in force until changed by another semicolon command.

COMMAS are used to tell MoTSart that a note or rest is to be played. If the comma is followed by a single space, a rest is played. Otherwise, you must follow the comma with a number (1-3) specifying the octave, followed by a letter (A-G) specifying the note (pitch). The note letter may be followed by "accidentals", represented as "+" for sharps and "-" for flats. Note that you can't flat the lowest A (1A), or sharp the highest G (3G).

The only other command is to set the overall TEMPO. This is done using the RAND command. See the demo; simply RAND 1200/(desired tempo). The number you divide into 1200 represents the number of beats (quarter notes) per minute; 120 represents two quarter-notes per second, or one 4/4 bar every two seconds.

MoTSart generates its own error codes. Error R means that you are trying to use a non-valid way of calling the routine, or don't have a REM after the IF USR BEEP THEN. Error (inverse semicolon) means that a SEMICOLON command (duration) is out of range. Finally, all other errors are trapped with error (inverse comma), which means that a COMMAND command is incorrectly formatted or out of range. If you get a semicolon or comma error report, the offending character in the line is flagged by turning to inverse video. BEWARE of errors right at the end of the line! If this happens, the end-of-line marker gets POKEd out, causing the next line to be "strung" together with your BEEP line. If you're not careful and manage to fall into this trap, DO NOT try to edit the line! The best thing to do in this case is to delete the line and re-enter it from scratch.

Now you and your ZX/TS can make beautiful music together!



TABLE 1: MOTSART DECIMAL DATA

33	0	1	9	34	118	64	205
35	15	42	22	64	35	126	254
234	40	2	207	26	35	126	254
25	32	20	35	126	214	29	254
16	56	6	126	203	255	119	207
124	60	50	9	64	24	230	254
118	200	254	26	40	6	126	203
255	119	207	125	35	126	167	32
24	58	9	64	95	58	50	64
87	1	45	6	11	120	177	32
251	21	32	245	29	32	238	24
188	214	29	254	3	48	215	245
35	126	214	38	254	7	48	206
167	40	23	254	3	48	3	60
24	16	32	4	198	2	24	10
254	6	40	4	198	3	24	2
198	4	79	35	126	254	21	32
3	12	24	8	254	22	32	3
13	24	1	43	241	71	128	128
7	7	129	254	255	40	151	254
54	40	147	79	6	0	229	42
118	64	9	9	9	9	78	35
70	35	94	35	86	225	24	2
24	157	175	245	175	245	197	211
255	11	120	177	32	251	245	0
62	0	62	7	61	32	253	241
193	197	219	254	11	120	177	32
251	193	241	60	253	190	9	40
11	35	43	245	62	3	61	32
253	241	24	209	241	60	253	190
50	40	6	221	9	0	0	24
194	27	122	179	32	188	24	184

LISTING 1: BASIC

```

2 REM MOTSART
3 GOTO 100
10 REM SET TEMPO SUBROUTINE
20 PRINT "TEMPO?"
30 INPUT TEMPO
40 RAND 1200/TEMPO
50 LET BEEP=16514
60 RETURN
80 REM WAIT SUBROUTINE
90 IF INKEY$="" THEN GOTO 90
95 RETURN
100 REM MUSIC DEMO
105 GOSUB 10
110 IF USR BEEP THEN REM ;8,2E;
5,2G;1, ;2,2G;C,2C;4,2D,2E,2F,2G
,3A;G,2D;8,2E;5,2F+;1, ;2,2F+;C,
2G;4,3A;3,3B;1,2B;4,3B;3,3A;1,2A
;4,3A;C,2G;2,2D,2E;6,2F;2,2E;4,2
D;2,2E,2F;6,2G;2,2F;4,2E;2,2F,2G
;4,3A,2G,2F,2E;B,2D;1,1D;2,2D,2E
;6,2F;2,2E;4,2D;2,2E,2F;6,2G;2,2
F;4,2E,2C,2D,2G;2,2G,2F+;2E,2F+;
G,2G
120 IF USR BEEP THEN REM ;8,2E;
5,2G;1,1G;2,2G;G,2C;6,2F;2,2F;6,
3A;2,3A;G,2D;8,2G;6,2G+;2,2G+;4,
3A,2F,2E,2D;8,2C,2D;G,2E;8,2G;6,
3C;2,3C;4,3A,2F,2E,2D;8,2G,2B;G,
2C;2,2C,2E,2G,3C,3A,2F,2D,2E,-,2E
,2G,3A,3B,3C;3,2C,1C
130 GOSUB 80
140 CLS
150 PRINT "RUN AGAIN?"
160 PAUSE 4E4
170 IF INKEY$="Y" THEN GOTO 100
200 REM LASER
210 LET TEMPO=1200
220 GOSUB 40
230 FOR N=1 TO 10

```

```

240 IF USR BEEP THEN REM ;1,3G+
,3G,3F+,3F,3E,3E-,3D,3C+,3C,3B,3
B-,3A,2G+,2G,2G-,2F,2E,2E-,2D,2C
+,2C,2B,2B-,2A,1G+,1G,1G-,1F,1E,
1E-,1D,1C+,1C,1B,1B-,1A
245 IF USR BEEP THEN REM ;G, ←
250 NEXT N
260 GOSUB 80
300 REM SIREN
310 LET TEMPO=600
320 GOSUB 40
330 FOR N=1 TO 5
340 IF USR BEEP THEN REM ;1,1A,
1A+,1B,1C,1C+,1D,1D+,1E,1F,1F+,1
G,1G+,2A,2A+,2B,2C,2C+,2D,2D+,2E
,2F,2F+,2G,2G+,3A,3A+,3B,3C,3C+
,3D,3D+,3E,3F,3F+,3G,3G+
350 IF USR BEEP THEN REM ,3G+,3
G,3F+,3F,3E,3E-,3D,3C+,3C,3B,3B-
,3A,2G+,2G,2G-,2F,2E,2E-,2D,2C+
,2C,2B,2B-,2A,1G+,1G,1G-,1F,1E,1E
-,1D,1C+,1C,1B,1B-,1A
360 NEXT N
370 GOSUB 80
400 REM SIMULATING 2 VOICES
410 GOSUB 10
420 GOSUB 470
430 GOSUB 480
440 GOSUB 480
450 GOSUB 470
460 IF USR BEEP THEN REM ,2C,1E
,2C,1E,2C,1E,2C,1E;4,2C
465 GOSUB 80
466 STOP
470 IF USR BEEP THEN REM ;1,2C,
1E,2C, ,2C,1E,2C, ,2G,2E,2G, ,2G
,2E,2G, ,3A,2F,3A, ,3A,2F,3A, ,2
G,2E,2G,2E,2G,2E,2G, ,2F,2D,2F,
,2F,2B,2F, ,2E,2C,2E, ,2E,1G,2E,
,2D,2A,2D, ,2D,1F,2D, ,2C,1E,2C
,1E,2C,1G,2C,1G

```

Note: line 350 is
the same as line 240.

Line 245 ends with a space.

```

475 RETURN
480 IF USR BEEP THEN REM ,2G,2C
,2G, ,2G,2E,2G, ,2F,2D,2F, ,2F,2
B,2F, ,2E,2C,2E, ,2E,1G,2E, ,2D,
2A,2D,2A,2D,2B,2D, ,1
485 RETURN
9000 REM SET UP DATA TABLE
9010 CLS
9020 PRINT "FREQ BC ACTUAL NO
.CYCLES
9030 LET BYTE=16770
9040 LET FREQ=440
9050 LET RATIO=2**((1/12)
9060 FOR N=1 TO 36
9070 LET BC=INT (((1.596E6/FREQ)
-199)/26+1.5)
9080 IF BC=0 THEN LET BC=1
9090 LET ACT=1.596E6/(199+26*(BC
-1))
9100 LET DE=INT (ACT*.013+.5)
9110 RAND BC
9120 POKE BYTE+0,PEEK 16434
9130 POKE BYTE+1,PEEK 16435
9140 RAND DE
9150 POKE BYTE+2,PEEK 16434
9160 POKE BYTE+3,PEEK 16435
9170 PRINT (INT (FREQ*10+.5))/10
;TAB 7;BC;TAB 11;(INT (ACT*10+.5)
))/10;TAB 18;DE
9180 LET BYTE=BYTE+4
9190 LET FREQ=FREQ*RATIO
9200 NEXT N
9210 STOP
9990 SAVE "MOTSART"
9991 GOTO 100

```

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THE HARDWARE

The board measures 3 1/2" x 3". It uses only two chips. It is supplied fully assembled. There is a built-in write protect switch to avoid accidental erasure of data. The 32K is divided in four 8K blocks which are individually controlled via DIP switch for mapping to various memory map locations. A long-life battery preserves memory contents. The circuitry has been designed to greatly reduce the risk of data loss caused by removing the unit from the computer. This makes the system very transportable. The board utilizes a standard feed-through connector. Memory control is extended to both 16K and 32K ram-packs. Bank switch applications are supported. There is built in hardware compatibility with THRUST and other hi-res programs. The hardware has four times the capacity and more flexibility than other similar memory enhancement products.

RIGTER OPERATING SYSTEM

The NVMS concept is completed by the RIGTER OPERATING SYSTEM (ROS). This is a full powered file handling system. Utilizing less than 600 bytes, ROS has these features. DIRECTORY displays all programs stored in memory by name and length in bytes. You have 44 entries per directory. SAVE transfers BASIC programs, variables, and machine code to storage. It works in conjunction with the NAME / RENAME features. LOAD transfers those programs to their normal RUN areas. MERGE allows the joining of two BASIC programs or variable files. EXIT allows you to quit ROS to an auto-run

program or the command line. ERASE deletes programs from system memory and automatically moves other programs to fill the space left behind. This eliminates blank areas of memory between files. File selection is accomplished using cursor movement. ROS utilizes terminate-and-stay-resident protocols. It is called from the command line by simply pressing REM followed by ENTER.

There are further enhancements to the ROS core. CLEAR DIRECTORY allows initialization of selected sections of memory while leaving others intact. RENUMBER is a natural companion to the MERGE feature. UNMERGE deletes blocks of BASIC programs. The comprehensive 15 page manual includes instructions for adding more directories and "hot keys."

APPLICATIONS

The DELTA DEVICE has many possible applications. A user can have programs such as NOVA, THRUST, MINI-XMOD, KRUNCHER, and a word processor instantly available with plenty of room left over. Other TS 1000 NVM devices can't equal that capacity. You can easily enhance the ROM by mapping a section of the NVMS into the ROM area. You can now design a customized prompt, develop hi-res graphics, or install a high speed tape loader all accessible using the regular command keys. Programmers will appreciate the ability to have more than one operating system available on the same machine. Imagine having one machine with FORTH, PASCAL, and the standard operating system instantly available.

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